Stevenson Kellogg Ernst & Whinney
Management Consultants

Project Report

MARKET OPPORTUNITIES FOR SELECTED ONTARIO-GROWN TRANSITION CROPS

Prepared for

Government of Ontario
Ministry of Agriculture and Food
Transition Crop Team

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I

INTRODUCTION

In recent years, growers of cash crops in Ontario have fallen upon increasingly bleak economic times. Traditionally, our growers have had to contend with the natural disadvantages of a short growing season and comparatively low yields. But increasingly, they have been confronted with other threats: depressed market prices which fail to keep pace with inflation, rising land values, increasing labour costs, demands for additional investment in facilities and equipment, and a growing trend among the major supermarkets to buy from U.S. sources on a more or less year-round basis. The food processing industry has also become much more concentrated with fewer large plants replacing smaller geographically diverse facilities. Moreover, changing demand patterns have left some farmers with no market for the crops that have traditionally been their mainstay.

Nowhere has the threat to farming been greater than in southwestern Ontario. Once the prosperous centre of the flue-cured tobacco industry in Ontario, it is now economically depressed. Changing consumer attitudes towards smoking have led to a major cutback in demand for tobacco leaf. Since 1982, production of tobacco in southwestern Ontario has fallen by almost 60%.

Given these trends and conditions, farmers in Ontario must learn to cultivate alternate crops -- or face further hardship. But from the farmer's perspective, the options are far from obvious. He or she needs to know:

- What crops to plant.
- When and for how long mature produce will be available.
- What prices can reasonably be expected during the maturity window?
- What yields to expect.
- Potential profitability and downside risk.

If, and only if, a farmer feels confident as to the probable return on an alternate crop, will he switch away from his traditional livelihood and risk his limited resources in a new venture.

To assist farmers with this process, the Government of Ontario, through the Ministry of Agriculture and Food, has established a Transition Crop Team. Its mandate is to work with commodity groups, associations, marketing boards and individual farmers to identify and support new crops (and expansion of selected existing crops) which have the potential to yield an attractive financial return to Ontario farmers. In this capacity, it aims to match crops which can readily be grown in Ontario with appropriate market opportunities.

Initial investigations identified six transition crops (or more correctly, groups of crops) which appear to offer a potential for yielding an attractive return to Ontario growers:

- Edible coloured beans for processing.
- Field tomatoes for the fresh market.
- Sweet and hot peppers for both the fresh and processing markets.
- Sweet potatoes, primarily for processing, potentially also for the fresh market.
- Garlic for both the fresh and processing markets.
- Herbs and spices, especially coriander, basil and dill in fresh and dried form for both fresh and processing purposes.

This study has been conducted by Stevenson Kellogg Ernst & Whinney for the Ontario Ministry of Agriculture and Food. Its purpose is to identify windows of market opportunity for the designated crops and pre-conditions for realizing those opportunities. Some specific objectives, subject to the availability of the necessary information, included:

- Estimation of available markets.
- Assessment of quality requirements.
- Estimation of prevailing price levels.
- Assessment of requirements for grading, packaging, presentation, marketing and distribution.
- Identification of competitive sources of supply.

The study focuses on Ontario markets for the above crops. However, to the extent our investigations yielded potential market opportunities in other jurisdictions, these were noted.

This report presents the results of that study. Following this introduction, we highlight the major findings of the study. Then we discuss for each crop in detail, issues of market size and structure, seasonality, pricing and market entry requirements.

The report concludes with a review of how Ontario growers might best realize the available opportunities.

II

HIGHLIGHTS

This report explores market opportunities for six transition crops that could potentially be grown in Ontario:

- Edible coloured beans for processing.
- Field tomatoes for the fresh market.
- Sweet and hot peppers for both the fresh and processing markets.
- Sweet potatoes, primarily for processing, potentially also for the fresh market.
- Garlic for both the fresh and processing markets.
- Herbs and spices, with particular reference to coriander, basil and dill in fresh and dried form for both fresh and processing purposes. Here are our major findings.

Opportunities exist for all of these crops, except coloured beans. The principal prospect is for import replacement, but without exception, realizations of any available opportunity presupposes that Ontario-grown produce is competitive from a price, quality and distribution standpoint.

Seasonal extension is a potentially attractive option for the major fresh crops, tomatoes and peppers in particular. Realization of this opportunity will require investment in post harvest preservation technology. It will also require cooperation and joint initiatives by growers.

Ontario producers could potentially export certain crops, for example, sweet potatoes, out of the province either to other Canadian provinces or the United States. However, growers must first strive to capitalize on opportunities that exist in Ontario. Only then should they look to supplying other markets out of the province.

MINIMAL OPPORTUNITY FOR COLOURED BEANS

Edible coloured beans do not appear to offer an especially attractive opportunity for Ontario growers. It would not be prudent to produce additional quantities of either kidney beans, the dominant Ontario bean variety, or other conventional varieties of coloured beans. Reasons for this include:

- The existing range of processed bean products are either stable or declining in popularity.

- Prospects for new coloured bean products depend on initiatives taken by the food processing industry. No major new initiatives are in evidence.

- Substantial quantities of Ontario grown coloured beans are already being sold on the world market. Prices are currently depressed and substantial quantities are being sold for food aid at $16-$17 farm gate per hundred weight -- a discount of $3 or more below normal commercial prices.

Related crops worthy of consideration include lupine beans, lentils and chickpeas. Our consumption of these products is small, but all are imported at the present time.

FIELD TOMATOES: OPPORTUNITY FOR IMPORT REPLACEMENT

We see little opportunity for **conventional, field-grown** tomatoes for the fresh market. Ontario field tomatoes are in abundant supply during the normal growing season. Production has increased in recent years, yet prices have not. We see no evidence of a supply shortage.

Yet there is a market for tomatoes of a type and quality comparable to those that are currently imported. Given a comparable product at a competitive price, traders and end-users alike would be more than willing to switch to a local source of supply. If 50% of imported tomatoes could be displaced during the Ontario growing season, it would create a market for Ontario growers of some 1.2 million pounds per week.

Another potential opportunity exists for Ontario growers to extend their supply season -- either earlier or later. If early bearing varieties could be brought to market a week or two earlier, not only would imports be displaced, but consumption would also be stimulated. This may or may not prove physically possible. Late season tomatoes afford a potentially more feasible opportunity. By using appropriate post harvest technology, late harvest tomatoes could be kept in sound, fresh condition for several extra weeks. This would allow supplies to be fed more slowly onto the market, stabilizing prices during the peak availability season and prolonging the total season. For each week of season extension, the potential so created could be 3 to 6 million pounds.

Production of roma and cherry tomatoes in Ontario is currently small relative to other field-grown varieties. Yet there is evidence of a possible market for additional quantities of both varieties. Cherry tomatoes fetch an especially attractive price. Roma tomatoes, if merchandised more effectively, could achieve greater volumes.

PEPPERS: MAIN OPPORTUNITY IN FRESH

In the fresh market, there is an opportunity for growers to sell additional quantities of peppers by way of season extension. If red or green peppers could be made available a week or two earlier, they would stand to displace the substantial quantities that are now imported during the last two weeks of July -- upwards of 2 million pounds. Similarily, at the close of the season, it should be possible to extend the supply of fresh peppers through the use of post harvest preservation technology. If attractive, fresh produce could be made available through, say, the first two weeks of October, import replacement on the order of 200,000 pounds per week should be possible. Further extension into late October and possibly into December, could replace import levels of over 1 million pounds per week at premium prices.

A more modest opportunity also exists for Ontario growers to produce additional quantities of specialty peppers -- assuming this is possible. Target varieties include yellow, black, jalapeno and cubanelle.

Prospects for growing additional quantities of peppers for established processors are attractive but, less so than for fresh. The quantity of peppers purchased for processing has risen substantially in recent years. The rate of increase is not expected to continue. Nevertheless, demand for certain varieties is expected to outpace the market as a whole. In particular, sweet red bells and hot banana peppers are expected to be in strong demand.

Another opportunity could be to produce dried or dehydrated peppers including paprika. At the present time, all such products are imported and there are no processing facilities in Canada.

SWEET POTATOES: OPPORTUNITES IN FRESH AND PROCESSING

Ontario growers could potentially displace some 14 million pounds of sweet potatoes imported into Ontario each year. With respect to the fresh market, the major retail chains are very interested in the product and would like to secure a local source of supply. Most feel consumption would be stimulated by increased availability from Ontario growers.

The processing industry also uses sweet potatoes, approximately 2 million pounds per year. All are imported and buyers express a strong interest in securing a local source of supply.

Displacement of 50% of these two markets would create a market of 7 million pounds per year for Ontario growers.

OPPORTUNITY TO MARKET MORE GARLIC

There is a significant opportunity for Ontario growers to market additional quantities of garlic. Ontario production is currently only 1/20th of the total requirement and further production could help displace imports.

Displacement of only 10% of the current fresh import volume would effectively double the current level of production. Were 50% of that volume to be displaced, production could rise to more than 1 million pounds annually -- an increase of ten-fold. Either scenario could well be feasible given quality product and competitive prices.

Another possible opportunity is to produce dried or dehydrated garlic products. These could include garlic granules and powders. All are used by the major food processing companies and all are imported at the present time.

CORIANDER, BASIL AND DILL: OPPORTUNITIES ON A SMALL SCALE

Opportunities exist for Ontario grown herbs and spices, however, quantities are small. The largest potential market is for coriander. Opportunities for additional quantities of cilantro, the plant variety of coriander, total as much as 150,000 pounds.

Demand is also growing for coriander seed. Processors currently importing seed are interested in a local supply.

Another opportunity could be to replace current imports of dried basil and dill with Ontario dried products. If Ontario processors were to confirm 50% of the current demand for dried basil it would create a market of approximately 100,000 pounds. Given the same displacement scenario for dried dill weed and dried dill seed the available opportunities would be 15,000 pounds and 50,000 pounds respectively.

III

EDIBLE COLOURED BEANS

A. THE CROP

Edible coloured beans exist in a wide range of colours and varieties. These include kidney, turtle, cranberry, pinto, great northern, small reds, and pinks. Each has its own distinctive characteristics and use. Details of those varieties relevant to Ontario and the study (though not all are grown here) are highlighted in Exhibit III-1.

EXHIBIT III-1

Variety	Colour	Major end use
Kidney	- Dark red - Light red - White	Chili, baking, salad Chili, baking, salad Baking
Turtle	Black	Soup, fried beans
Cranberry	Pink to red	Italian bean soup
Pinto	Tan with brown	Baking, chili
Great Northern	White	Italian dishes, baked
Small Reds	Dark red	Mexican, spanish dishes
Pinks	Pinkish	Soup, spicey cooking

Coloured beans typically have a long storage life. When properly dried and kept in a temperature and humidity-controlled environment, most varieties may be kept for a year or even more. However, some varieties are more susceptible to mold and fungus after prolonged storage than others.

A guide to bean grading is published by the Canadian Grain Commission. Appendix A contains a summary of Canadian bean grades.

Nearly all coloured beans are used for processing purposes. Some small quantities are, however, sold as a dry good at retail. This latter segment is not only small, it is also declining as consumers move to more convenient foods and away from products such as coloured beans which require lengthy preparation.

B. ONTARIO GROWERS PRODUCE UPWARDS OF 36 MILLION POUNDS PER YEAR

Ontario devotes approximately 20,000 acres to the production of coloured beans. The principal growing areas are the counties of Kent, Elgin, Middlesex and Huron. Most of the crop is grown by some 250 growers.

Production of edible coloured beans in 1987 is estimated at 36 million pounds. While details as to the exact level and trend of production are sketchy, available data suggests that total output has declined somewhat over the past few years. Production does, of course, fluctuate considerably from year to year.

Two varieties account for upwards of 80% of Ontario's bean production. Kidney beans -- both light red and dark red account for about 65% of production, with cranberry beans making up another 15%. Approximately 5% is devoted to dutch brown bean production, with the remainder a mix of white kidney, black turtle, smalls, pinks, great northerns and pinto. However, the exact varietal mix varies from year to year. For example, in 1987 no pintos were grown and only a few blacks.

C. BEANS SOLD FOR PROCESSING OR EXPORT

There are two main markets for Ontario's coloured bean crop:

- Food processors in Ontario; and
- Export from Canada.

Approximately two-thirds of the Ontario crop goes to the processing market. Most of the remainder is exported mainly to Europe and Latin America. A small portion -- perhaps 10% -- of the export volume, is devoted to international food aid.

Coloured beans are, of course, an international commodity. Prices and trade flows vary widely from year to year as a function of international supply and demand. In most years, Ontario growers are able to supply all of the needs of the Ontario Processing Industry. As a result, very few coloured beans are imported in a year of normal growing conditions. Ontario typically only imports coloured beans when:

- The domestic crop fails as happened in 1986 when heavy rains affected the harvest.

- Products are imported to cover a short term deficiency in a particular variety.
- Other sources of supply are less costly.

As with all commodities, price is a critical issue. The world market for beans is highly competitive. Large quantities of coloured beans are grown in various parts of the world and production in Minnesota, North Dakota and Alberta poses a substantial threat to Ontario producers. Prevailing prices are thus determined by an international supply and demand regime; not merely the balance of supply and demand in the province of Ontario.

D. PROCESSORS WANT KIDNEY BEANS

Eight companies buy most of the beans used for processing purposes in Ontario. They are:

- H. J. Heinz of Canada Ltd.
- Stokely Van Camp of Canada Ltd.
- Campbells Soup Co. Ltd.
- Libby's Division of Nestle.
- Nabisco Brands Ltd.
- Unico, Division of Culinar Foods, Inc.
- Cobi Foods Inc.
- Lancia-Bravo Foods.

Kidney beans -- both light red and dark red -- are the major variety used by these companies. Other varities used include chickpeas, lupine, lentils and the popular navey white bean.

The current trend in demand for processed kidney bean products is not encouraging. Recent retail market research data (A.C. Neilson) point to consumption of canned kidney bean products declining in 1987, by almost 10% over the preceding year. While these data pertain only to the retail market, the trend does not auger well for future demand for raw kidney beans.

E. EXPORT MARKET HIGHLY OPPORTUNISTIC

The world market for beans is highly competitive and highly cyclical. Firstly, Argentina, Mexico and other Southern hemisphere countries can produce at a very competitive price. Second, changing weather patterns generate wide swings in production from year to year. As a result, export opportunities for Ontario-grown beans are uncertain and variable from year to year. They are virtually impossible to predict.

Not only do Ontario growers face competition from foreign growers. They must also compete with Western Canadian producers. Manitoba and Alberta have some 30,000 acres of coloured beans and are currently producing smalls, pinks, pintos and cranberrys. Indeed, Western dealers focus specifically on the export market because of their small population base. This year, much of the Western production will be sold for food aid purposes. The tender price per pound to the grower is a low 17¢, whereas general market prices average over 20¢.

Varietal preferences for beans vary widely by country. The following is a brief summary of the major export destinations by variety.

Variety	Market
Dutch brown	Holland, Italy
Cranberry	Greece, Italy, France, U.K.
Black turtle	Mexico, Brazil
Kidneys	U.K., Cuba, Carribean
Pinto	Mexico
Great northern	Greece, Algeria
Smalls, pinks	Food aid countries

F. MOST GROWERS SELL TO DEALERS

Six major dealers contract for most of the coloured beans grown in Ontario:

- Chatham Beans Limited.
- W. G. Thompson and Sons Limited.
- The Great Canadian Bean Company Inc.
- Cook's, Division of Gerbro Inc.

- Ferguson Brothers of St. Thomas Limited.
- Hensall District Cooperative Inc.

It is estimated that some 85%-90% of all beans grown in the province are sold to these dealers. They are the first receivers of the product with the farmer delivering to them. The dealer in turn cleans them, arranges for storage in climate-controlled elevators, negotiates sales to both domestic processors and export markets, and finally arranges for delivery.

The terms of dealer-grower contracts vary. The contracts can carry all or part of the grower's production and may be negotiated on the basis of volume, yield per acre or some other terms. Typically, one-half of a grower's crop is negotiated at a set price ahead of the season. The remainder is left open for negotiation at the price prevailing during the season. The open price, negotiated after the harvest, may be higher, but is totally dependent on the supply/demand balance of international markets.

Growers could bypass the dealers to supply processors given that they:

- Assemble commercial quantities.
- Provide an assurance of supply including access to backup supply from alternate sources in the event of a local crop failure.

G. CURRENT PRICE $19-$25 PER HUNDRED WEIGHT TO GROWER

Prices for coloured beans vary widely from year to year. To a much lesser degree, they may also vary during the course of a season.

Quality has an important bearing on price. Buyers, including the dealers noted above, typically offer a premium of approximately 10% or $2.00 per hundred weight for first quality produce.

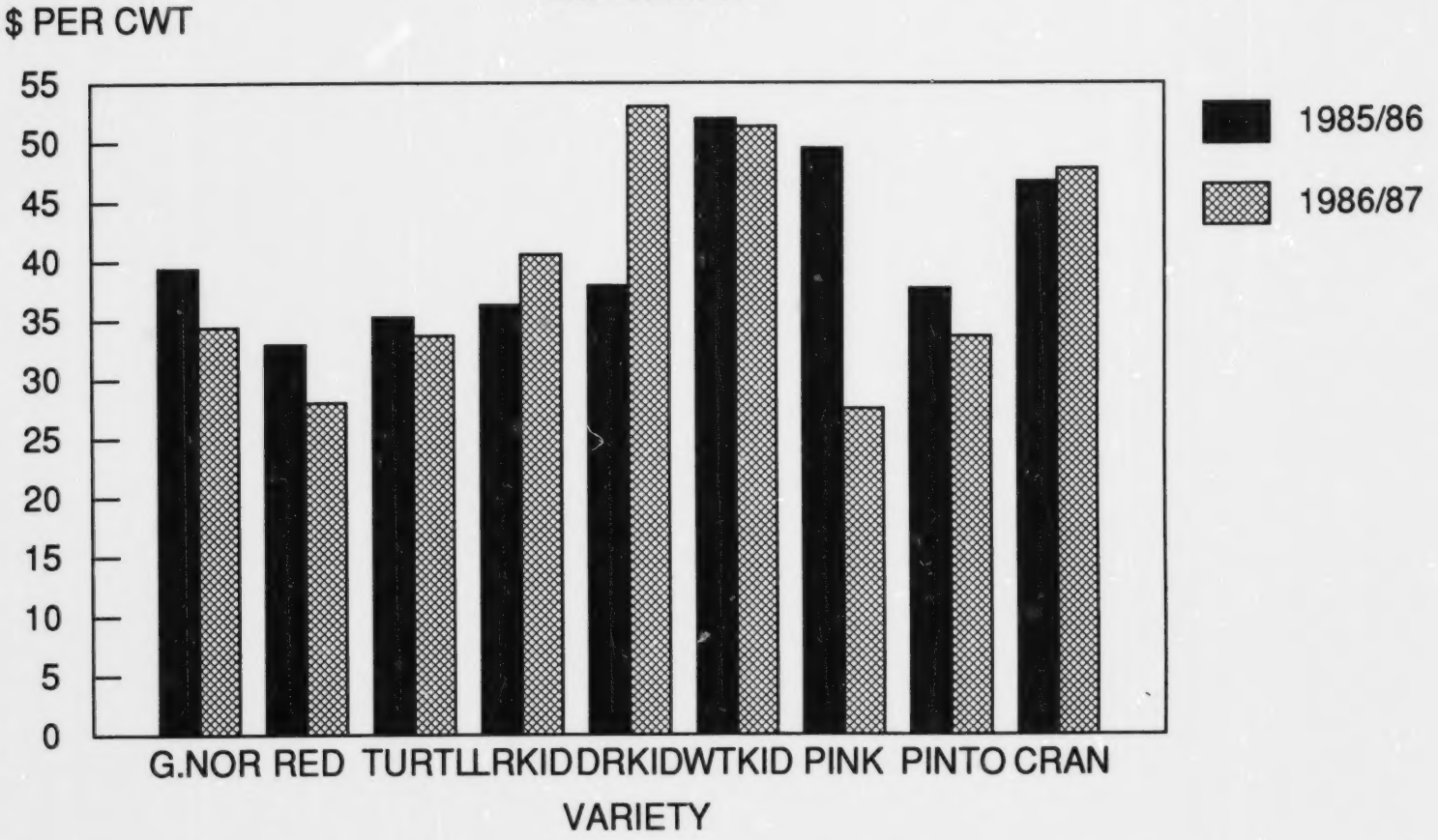
Bean prices are currently depressed. Prices for standard quality light and red kidney beans (the most popular variety) are in the range of $19-$20 per hundred weight to the grower. For premium quality beans of the same variety, dealers are now willing to pay $21-$22. For certain other varieties, notably cranberry, dealer buying prices are in the $23 (standard quality) to $25 (premium) range.

Wholesale prices are, of course, higher. During the 1986/87 season the average ranged from $27-$53 according to type. Exhibit III-2 provides details.

The Government of Canada, in association with participating Provincial governments and producers, has recently developed a Tripartite Agreement for beans. In future, growers who enroll on it will receive a minimum price for coloured beans. The price, still to be determined, will lower risk and help stabilize returns.

EXHIBIT III-2

COLOURED BEAN PRICES
fob dealer



Source: Agriculture Canada

H. LIMITED MARKET OPPORTUNITY FOR ONTARIO GROWERS

Edible coloured beans do not appear to offer an especially attractive opportunity for Ontario growers. The potential for the market to absorb additional volume is limited. Reasons why:

- The existing range of processed bean products -- red kidney beans being the most popular -- are declining in popularity. There is no indication of this trend reversing in the forseeable future.

- Prospects for new coloured bean products will depend on initiatives taken by the food processing industry and general trends in food consumption. To the degree that Mexican, Italian or other ethnic foods with a significant bean content become more popular, consumption could increase. However, prospects for this happening in the near future are very limited.

- While offering virtually unlimited volume potential, exports are subject to wide variations and intense price pressure. Food aid buying at a discount of three dollars or more per hundred weight over normal commercial prices -- is absorbing an increasing proportion of the available supply. The market exists, but the prices are low and uncertain.

In summary, it would not appear prudent for growers to produce additional quantities of kidney beans, or other conventional varieties of coloured beans. However, related crops worthy of consideration which could offer a profitable business include:

- Lupine beans, generally used as animal feed.

- Lentils, popular in soups and Middle Eastern dishes.

- Chickpeas, generally boiled or mashed, popular in Mediterranean dishes and salads.

While quantities are relatively small, all of these varieties are being imported at the present time. If they could be grown on an economic basis within the province, dealers would be willing to contract for them and hence displace the existing import trade.

IV

FIELD TOMATOES FOR THE FRESH MARKET

This chapter discusses market opportunities in Ontario for field tomatoes sold in fresh form.

Three main groups of cultivars are popular with the fresh market:

- Field tomatoes -- various varieties ranging in season, size, disease resistance and other characteristics, commonly known as fresh retail tomatoes.
- Roma tomatoes -- popular for home processing.
- Cherry tomatoes -- small and especially popular with the hotel and restaurant trade.

Other varieties are grown specifically for processing. However, this market is not considered here.

A. RISING PRODUCTION, FLAT PRICES

Ontario growers produce over 100 million pounds per year of field-grown tomatoes for the fresh market. Output has risen steadily over the past few years, increasing from 85 million pounds in 1983 to 111 million pounds in 1985. In 1986, an unusually good crop year, production is reported to have jumped to 151 million pounds.[1] Ontario greenhouse tomatoes add a further 32 million pounds to this figure, bringing the total of locally grown tomatoes sold as fresh to more than 180 million pounds in 1986. Exhibit IV-1 shows this.

Over the same period, prices have remained more or less stable. Grower values for tomatoes in 1986 averaged 27¢ per pound, up 8¢ from the year before, but likely to drop back to the 20¢ range in 1987. Average grower values for Ontario-grown fresh and greenhouse tomatoes for 1983-1986 are shown in Exhibit IV-2.

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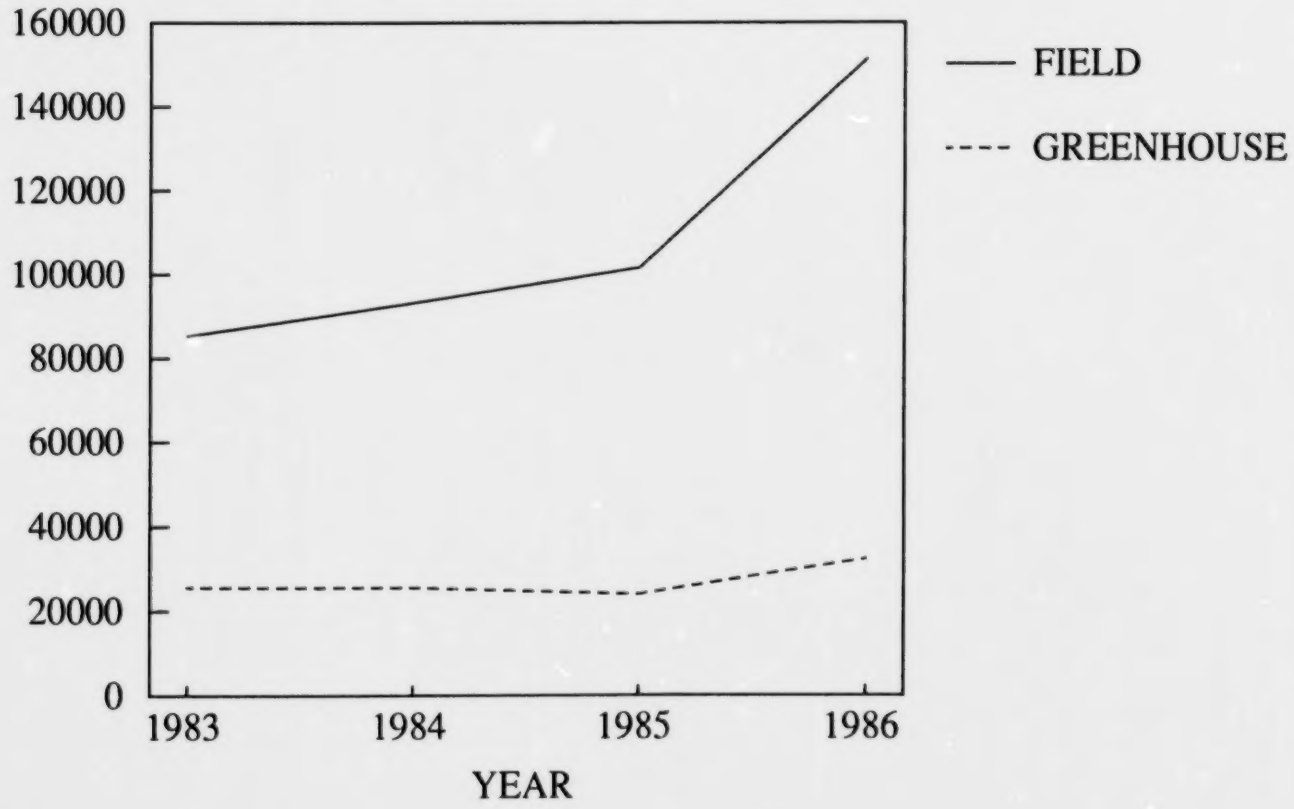
[1] Preliminary estimate from the Ontario Ministry of Agriculture and Food (may be subject to revision).

EXHIBIT IV-1

FRESH TOMATO PRODUCTION IN ONTARIO

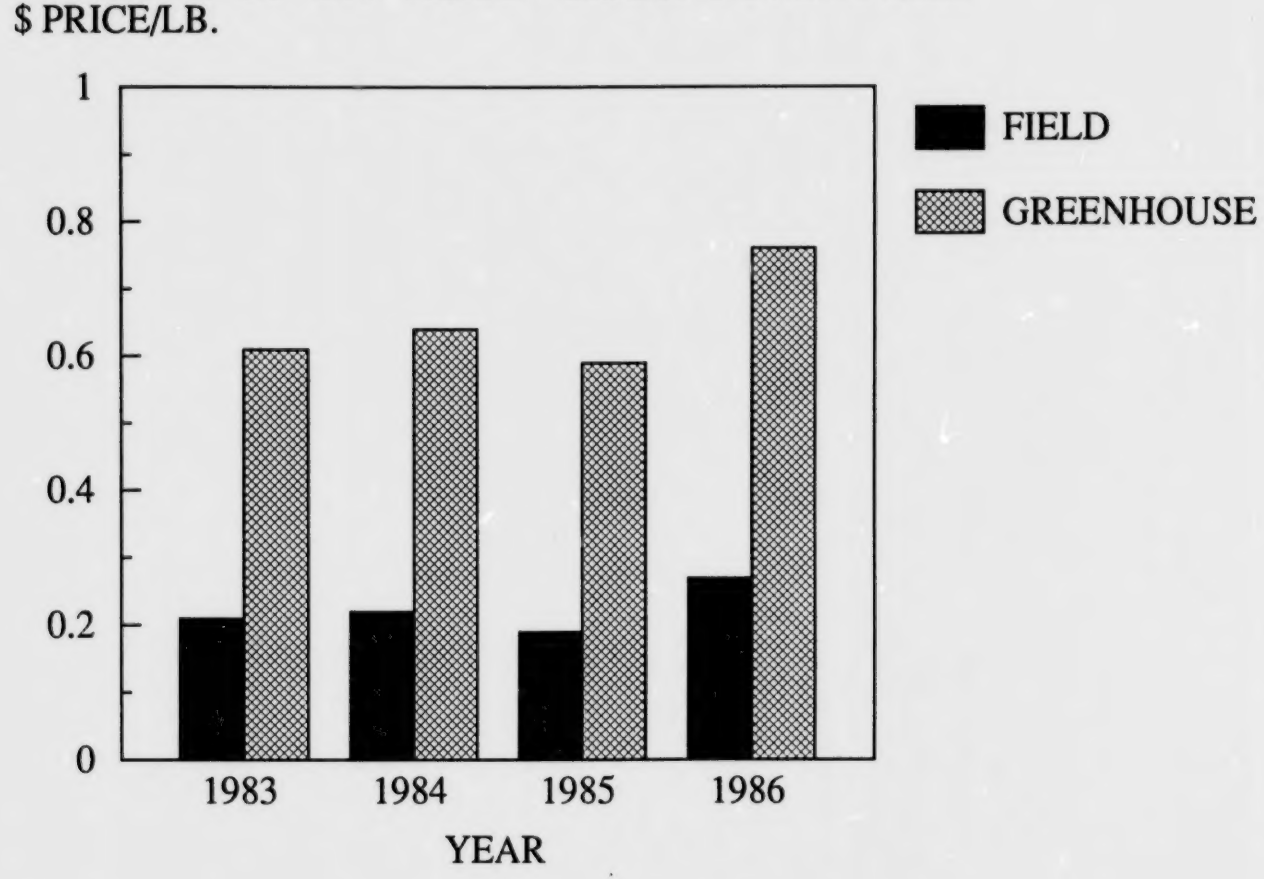
000 LBS



Source: Ontario Ministry of Agriculture and Food

EXHIBIT IV-2

VALUE OF ONTARIO FRESH TOMATOES



Source: Ontario Ministry of Agriculture and Food.

B. 2.3 MILLION POUNDS PER WEEK IMPORTED DURING THE ONTARIO GROWING SEASON

All of the Ontario field-grown crop is marketed from mid-July through mid-October. This represents an average flow onto the market of approximately 8 million pounds per week (excluding losses and waste), though much of the crop is marketed in late August and September.

During this same period of mid-July through mid-October, Ontario imports an average of 2.3 million pounds per week. With some variations, this flow is maintained each and every week throughout the total Ontario growing season. Exhibit IV-3 provides an estimate of imports by week for the 1986 season. The data shows that imports do drop during the height of the Ontario growing season, but import quantities remain substantial, irrespective of the availability of fresh, local tomatoes.

Why is this? Ontario tomatoes are popular with the retail market. During the season large quantities are sold by the major retail chains, smaller independent supermarkets, specialty fruit and vegetable stores and farmers markets. Ontario tomatoes satisfy a market niche which prefers a natural product, as reflected by freshness, taste and nutritional value. Imported tomatoes differ from Ontario tomatoes and satisfy a different market niche. Of the 30 million pounds or so imported during the 1986 Ontario season, well over one-half was consumed by the hotel, restaurant and institutional trade. This segment of the market prefers a tomato which is attractive and uniform in appearance and which may be sliced neatly by mechanical methods.

Not all imported tomatoes are sold for foodservice use. This produce also enjoys a distinct following in the consumer market. It is said to be bought by consumers that are primarily concerned with attractive appearance, consistency of size and firmness.

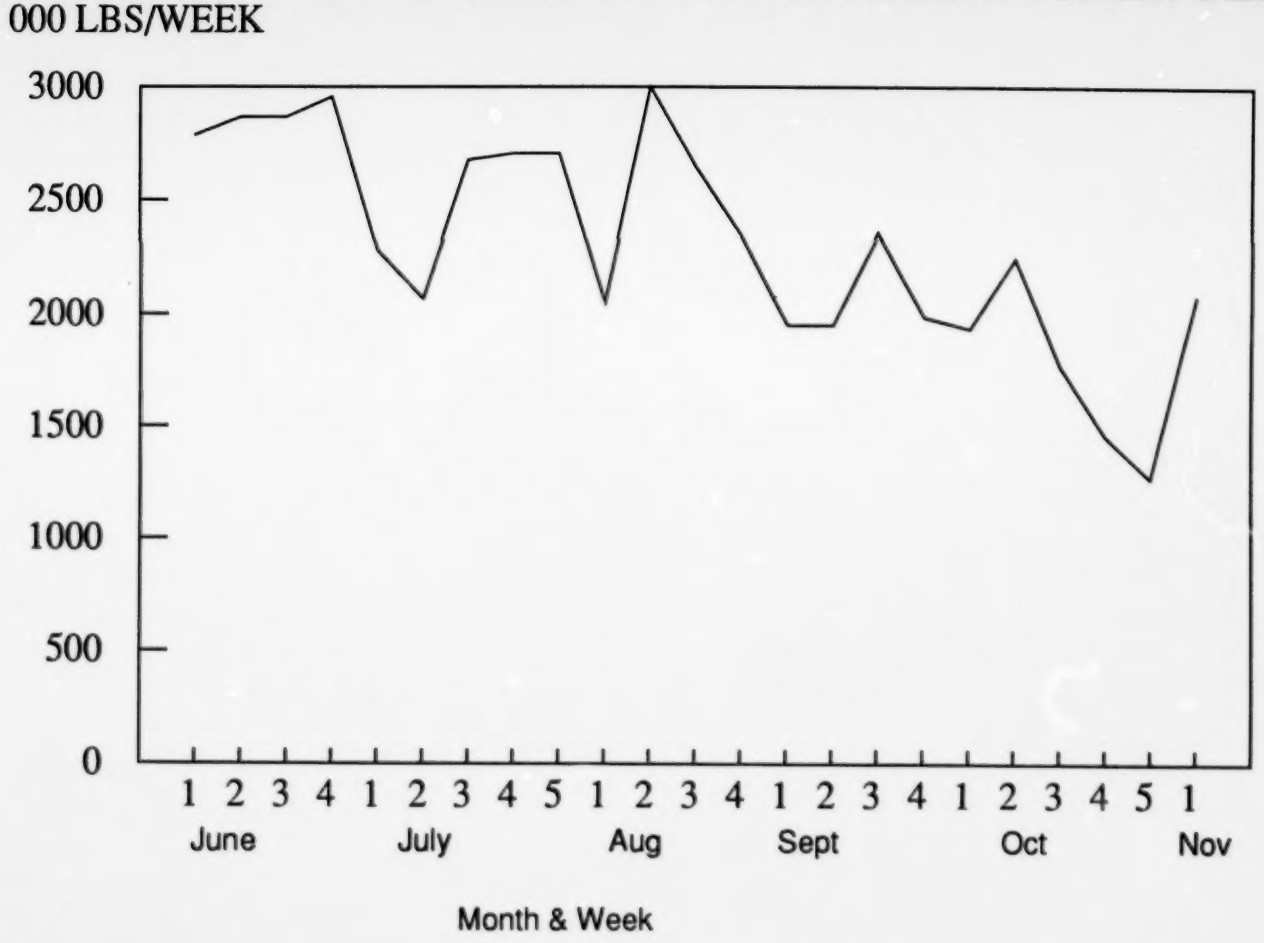
As one tomato importer described his customer's requirements: tomatoes must be consistently plump (good tomato shape), well coloured, slightly pliable to the touch and without splits or cracks.

C. IMPORTS FETCH A PREMIUM PRICE

Import tomatoes command a significant premium over domestic tomatoes. During most of the 1986 season the wholesale premium paid for imported red tomatoes ranged from 12¢ to 33¢ per pound. The corresponding premium percentage, ranged from 17% to 91% with an average of 55%. Exhibit IV-4 provides details.

EXHIBIT IV-3

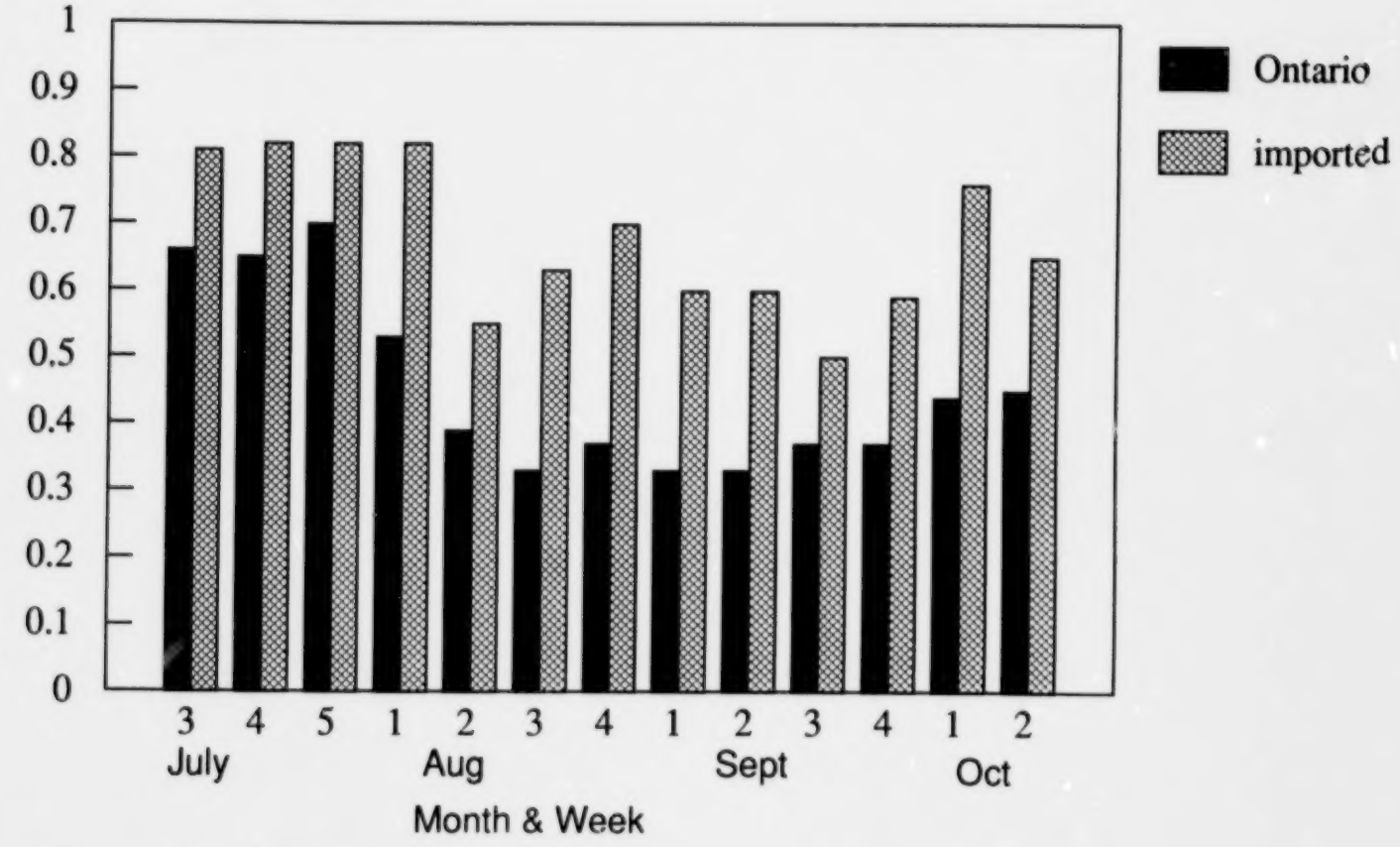
ONTARIO SEASONAL IMPORTS OF FRESH TOMATOES-1986



Source: SKE&W estimates based on data from Statistics Canada and Ontario Food Terminal.

EXHIBIT IV-4

ONTARIO & IMPORTED TOMATOES
wholesale price comparison - 1986



Source: "Ontario Fruit and Vegetable Report", daily Toronto Food Terminal Reports, O.M.A.F.

D. OPPORTUNITY FOR ONTARIO GROWN TOMATOES

We see little opportunity for **typical, field-grown**[1] tomatoes for the fresh market. Ontario field tomatoes are in abundant supply during the normal growing season. Production has increased in recent years, yet prices have not. We see no evidence of any supply shortage. Any further increase in production by Ontario growers would inevitably depress prices even further.

1. Import replacement

A market for tomatoes of a type and quality comparable to those that are currently imported, however, does exist in Ontario. Given a comparable product at a competitive price, traders and end-users alike would be more than willing to switch to a local source of supply. If all imports were to be displaced, this would constitute a net opportunity averaging 2.3 million pounds per week from mid-July through mid-October -- or a total of approximately 30 million pounds during the season. It would be more realistic to assume that, say, 50% of the imported tomatoes could be displaced, in which case the market would still be significant and amount to some 15 million pounds during the season or 1.2 million pounds per week. All would be to the net advantage of Ontario as none of the market is currently being supplied by local farmers.

For this potential to be realized, strict product conditions will need to be met. If they are not, imported tomatoes will continue to flow into Ontario irrespective of any attempt to displace them. Those conditions are as follows:

- **Appearance.** Tomatoes must be of a consistent size and colour, clean and have no cracks or "cat eyes" around the stem.

- **Size.** Size preferences vary. Tomatoes for mechanical slicing by the hotel and restaurant trade need to be large and firm. Yet, small cherry tomatoes are preferred for use as a garnish. More important than size is consistency. Buyers want to specify the size they require and be confident of receiving a product which meets that specification.

- **Colour.** Typically, the closer to bright red the better, but this is not essential. Again, consistency and uniformity is the issue.

- **Texture.** Tomatoes (other than cherry) need to be firm but pliable. Texture is especially important for hotel and restaurant applications where the product is sliced mechanically. Once sliced, the flesh must not fall away from the skin and seeds and juice must be contained.

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[1] Product that is characterised by irregular shape, uneven ripening, thin skins and August to September ripening.

- **Durability.** Longer lasting, more durable tomatoes with firm skins. These characteristics are important to packers and distributors. They seek a product which may be handled quickly without fear of excessive bruising. They also prefer items which may be held in inventory without deterioration for five days or more.

- **Packaging.** To compete directly with imports, tomatoes for the retail trade would need to be packed in either cellophane ("cello tomatoes") or on trays ("tray tomatoes"). Standard weights are either 1 pound, 1.5 pounds or 2.0 pounds. Such functions need not, of course, be provided by the grower. For the institutional trade, the standard package is typically 20 or 25 pound cartons.

Baskets are considered undesirable by both the retail and institutional markets. They are too big for the retail customer and too small for most institutions. Nor do they adequately protect the product from bruising. Standard cartons are much preferred.

The Province of Ontario grading regulations for field tomatoes are contained in the Farm Products Grades and Sales Act, Regulation 332/80. A summary of the regulations is provided as Appendix B to this report.

2. Extend supply season

Ontario consumes many more fresh tomatoes during the Ontario growing season than it does at other times of year. Reason: the flow of import tomatoes remains more or less stable year round. During the late summer and early fall, Ontario consumes its own domestic crop plus its imports; other times of year, Ontario consumes only imported and greenhouse tomatoes.

A potential opportunity exists for Ontario growers to extend their supply season -- either earlier or later. If early bearing varieties could be brought to market a week or two earlier, consumption would be stimulated. Early season prices would also be more attractive than in late August and September. However, we recognize this may not be physically possible.

Late season tomatoes afford a second, potentially more feasible opportunity. By using **appropriate post-harvest technology,** late harvest tomatoes could be kept, at least potentially, in sound, fresh condition. This would allow supplies to be fed more slowly onto the market, stabilizing prices during the peak availability season and prolonging the supply season.

For each week of season extension, the potential market so created could be 3 to 6 million pounds. Based on 1986 price levels, wholesale prices for early season tomatoes could be in the range of 80¢ to 1.05¢ per pound, while prices for a late season supply could be in the 75¢ to $1.15 per pound range.

3. More roma and cherry tomatoes

Production of roma and cherry tomatoes in Ontario is currently small relative to other field-grown varieties. Yet, there is evidence of a potential market for additional quantities of both varieties.

a) Cherry tomatoes

Ontario imports upwards of four million pounds of cherry tomatoes a year. About 10%, or 400,000 pounds is imported during the Ontario season, from early August to mid-October. Based on scenarios of 10% and 50% import replacement, potential volumes would be in the 40,000 to 200,000 pound range.

During the local season cherry tomatoes fetch an attractive 45¢ to 75¢ per pound wholesale. Traders we spoke with felt there was a potential for selling four or five times the current quantity, both retail and foodservice.

b) Roma tomatoes

Locally grown fresh romas are typically sold through smaller retailers and farmers' markets. The volume is correspondingly small. The major retail chains (Loblaws, A&P, IGA and Steinbergs) currently sell an estimated 350,000 pounds of romas during the Ontario season. However, these retailers see a potential to increase this volume by orders of magnitude. Pre-conditions for doing so include better merchandising, improved sorting, cleaner product and better packaging. Given these conditions are met, some of the supermarket buyers we spoke to suggest total sales could be increased as much as ten-fold.

It should also be noted that canned roma tomatoes are imported from Italy. Such products could be packed in Ontario, given the interest from processors.

* * *

The potential to increase sales of both cherry and roma tomatoes through the major chains in Ontario alone (Loblaws, A&P, IGA and Steinbergs) is significant. Current consumption of the two varieties through these outlets totals about 800,000 pounds per season. Given the ratio of increase mentioned, an additional 1.8 million pounds of cherrys could be sold and 3.2 million pounds of romas.

Necessarily, these estimates are speculative, but the potential remains if quality requirements are met and merchandising handled properly. Prevailing wholesale prices suggest that cherrys could fetch an average seasonal value of 45¢ to 75¢ per pound and romas 28¢ to 48¢ per pound respectively.

4. Potential for U.S. exports

Our study did not examine the U.S. market specifically. However, traders tell us there is a substantial market during the Ontario season for tomatoes that satisfy all of the quality and packaging conditions noted above. We were told that during the Ontario season, various U.S. markets including Atlanta, Georgia and Houston, Texas, have a shortfall of fresh tomatoes. These markets are currently supplied by growers in Michigan and Pennsylvania, whose tomato season is similar to Ontario's.

Ontario brokers report that they frequently have requests from U.S. buyers seeking a supply of **quality** tomatoes. The demand is **not** for conventional, Ontario field tomatoes. The market is for uniform, well-coloured premium product. Some of these requests are said to be for 20-25 trailer loads a week for at least a month. The potential for this business alone is thus 3-4 million pounds during the season. We understand that these requests have not been filled to date for the following reasons:

- The quality of tomato required is not available in quantity in Ontario.

- The U.S. imposes a duty of 25%. Ontario tomatoes thus become uncompetitive in the United States -- at least at the present time. A favourable outcome of the current free trade negotiations could improve the situation. If it does, export opportunities for Ontario growers will improve materially.

V

SWEET AND HOT PEPPERS

Sweet and hot peppers may be grouped into five main categories:

- Banana peppers -- typically about five inches and pendant shaped, they may be both sweet and hot. Varieties include red (for example, Super Shephard) and yellow (for example, Hungarian).
- Green bells -- usually about three inches in diameter and preferred when totally green.
- Red bells -- also about three inches in diameter and optimal when totally red.
- Multi-coloured bells -- about three inches in diameter again, but in this instance partially red and partially green.
- Rainbow bells -- these may be green or red or they may be white, purple, orange, brown or black.
- Other special varieties including cubanelles and jalapeno, available in red, green, yellow and orange.

Within each of the above categories, there are a range of different cultivars. Locally grown peppers begin to mature in late July and are available through mid-October.

A. 35 MILLION POUNDS GROWN

Ontario produced upwards of 35 million pounds of peppers in 1986. This figure is down slightly from 1985 but still well ahead of the two previous years. Exhibit V-1 shows this.

EXHIBIT V-1
Production of fresh peppers in Ontario (000 lbs.)

	Fresh	Processing	Total
1983	16,922	8,316	25,238
1984	10,234	8,792	19,026
1985	27,103	10,695	37,798
1986	23,193	12,584	35,777

Source: The Ontario Vegetable Growers' Marketing Board and the Ministry of Agriculture and Food.

B. MINIMAL IMPORTS DURING HEIGHT OF ONTARIO SEASON

In a typical year, Ontario imports some 40 million pounds of peppers. However, only a small portion of this quantity arrives during August and September, the peak supply months for Ontario. Exhibit V-2 shows the pattern of imports. In particular, it shows that in 1986, 3 million pounds of peppers flowed into Ontario during the months of August and September. Exhibit V-3 shows the pattern of pepper prices during the season. All seasonal imports go to the fresh market.

C. THE FRESH MARKET

During the Ontario supply season, Ontario growers enjoy most of the fresh market. Nevertheless, as noted above, imported peppers are still in demand. These imports represent a mix of different varieties of peppers from different sources. Certain types of peppers demanded during the season are unavailable domestically. Others are in short supply at certain times. Exhibit V-4 shows examples of imports to the Toronto Food Terminal during the 1986 season.

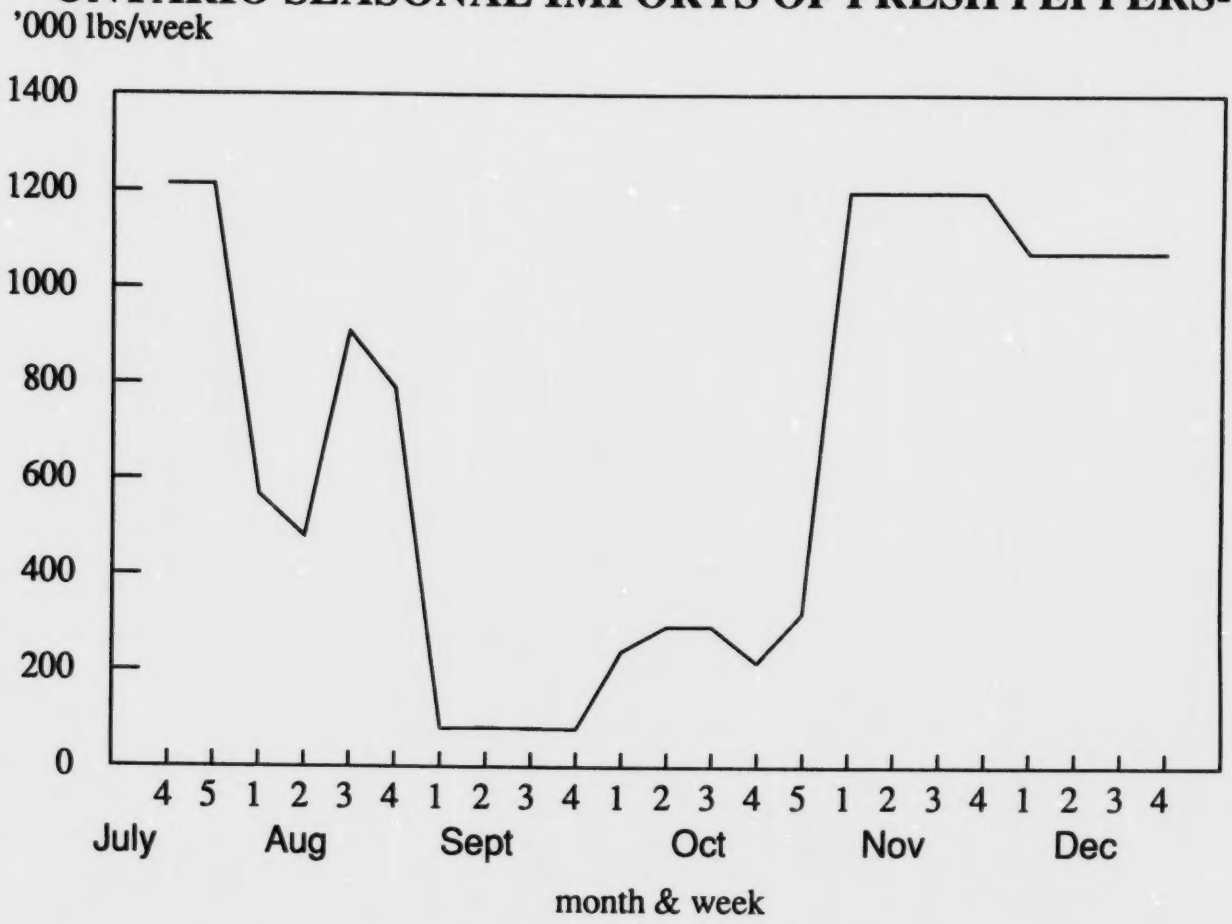
Imports of Florida green peppers in early August reflect the fact that early season domestic peppers are not yet comparable in quality to U.S. products. Rainbow or coloured peppers, along with jalapeno and cubanelles are imported throughout the growing season.

Red and green peppers are by far the most popular varieties sold at retail. Although detailed information on the overall varietal breakdown is unavailable, estimates provided to us by the major retailers suggest the following breakdown.

► Green	61%
► Red	33%
► Yellow	2%
► White, purple, black and orange	4%
Total	100%

The institutional market -- hotels, restaurants, cafeterias, etc. -- consumes substantial quantities of peppers. The key criterion here is consistency. Buyers require the product to be uniform in colour, irrespective of whether red, green or yellow. They also require consistency in size, whether small, medium or large.

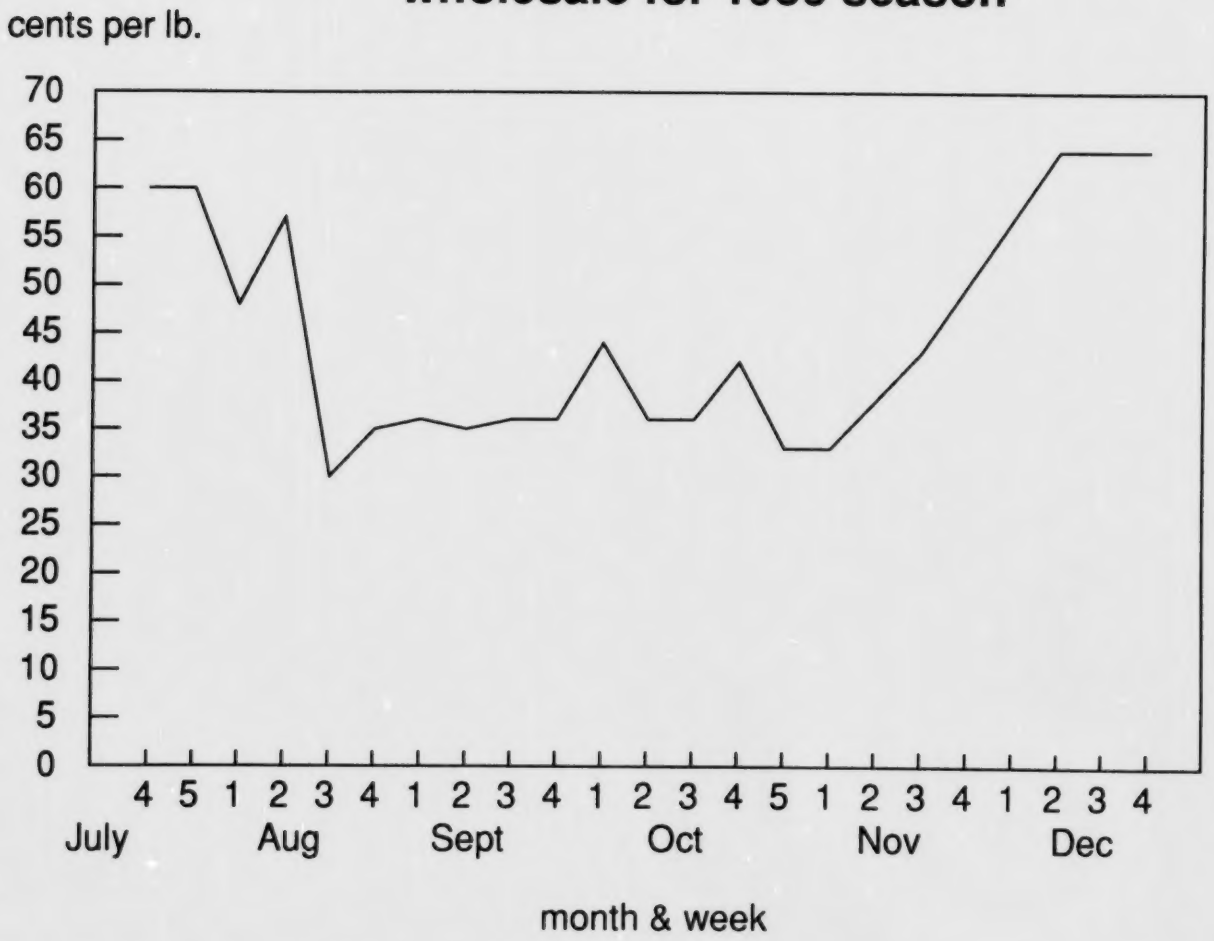
ONTARIO SEASONAL IMPORTS OF FRESH PEPPERS- 1986



Source: Stevenson Kellogg Ernst & Whinney estimates based on information from Statistics Canada and the Ontario Food Terminal.

EXHIBIT V-3

FRESH PEPPER PRICES
wholesale for 1986 season



Source: Ontario Food Terminal

EXHIBIT V-4
Imports of selected fresh peppers at Toronto Food Terminal, 1986

Variety	Timing	Source	Wholesale Price ($/lb.)
Green	Early August	Florida	0.58
- Extra large			
- Large			
- Medium			
- Small			
Red	Early August	California	1.40
	Early September	Holland[1]	1.80
Yellow	Early August	California	0.94
Black	Early September	Holland[1]	1.80
Jalapeno and Cubanelle	August-September	Florida	0.66-1.22

Source: Daily Fruit and Vegetable Report, Toronto Food Terminal, O.M.A.F.

[1]Greenhouse grown.

3. Opportunities for Ontario farmers

The principal opportunity for growers to sell additional quantities of peppers relates to season extension -- either earlier or later. If red or green peppers could be made available a week or two earlier, they would stand to displace the substantial quantities that are now imported during the last two weeks of July -- upwards of two million pounds in 1986. In 1986, prevailing wholesale prices averaged 60¢ per pound -- nearly double the September average. If possible to achieve, this would be an attractive time slot for growers to target.

At the close of the season, it should be possible to extend the supply of fresh peppers through the use of **post harvest preservation technology.** If attractive, fresh produce could be made available through, say, the first two weeks of October, import replacement on the order of 200,000 pounds per week should be possible. However, based on 1986 levels, prices would not be materially higher than those received in September -- about 40¢ per pound wholesale.

Further extension into late October and possibly into December, could replace import levels of over 1 million pounds per week, at significantly higher prices.

The second, though more modest, opportunity for Ontario growers would be to produce additional quantities of specialty peppers -- assuming this is possible. Target varieties could be yellow, black, jalapeno and cubanelle. All of these are imported in limited quantities throughout the Ontario growing season. Exact quantities remain unknown, though Ontario's major retail chains report average weekly sales of these products on the order of 30,000 pounds per week. Wholesale prices vary widely from 60¢ per pound to almost $2.00 for these varieties. (See Exhibit V-4.)

In support of these opportunities, farmers should recognize that Ontario's imports of peppers during the growing season continue to rise. Even though local production has risen in recent years, imports in August and September have increased since 1984. Moreover, average prices have remained more or less stable in the 45¢ range. Exhibit V-5 confirms this.

EXHIBIT V-5
Ontario imports of peppers -- August-September 1984-1986

Year	000 lbs.	Wholesale Price ¢/lb.
1984	2,242	43
1985	2,403	46
1986	2,900	46

Source: Statistics Canada.

D. OPPORTUNITIES FOR PROCESSING

Production of peppers for processing in Ontario has grown substantially in the past few years. In 1986, 12.5 million pounds went to processing -- up 18% from 1985. The largest growth has been in hot banana peppers -- up almost 80% over 1985. Exhibit V-6 provides details.

EXHIBIT V-6
Production of peppers for processing in Ontario (tons)

	1982	1983	1984	1985	1986	5 Yr. Avg.
Green bell	1,491	1,131	1,336	1,708	1,736	1,480
Red bell	372	276	201	215	321	277
Green/red mix (maximum 15% red)	125	321	269	293	605	323
Multicoloured	541	1,147	1,140	1,603	1,287	1,144
Sweet banana	250	148	148	162	206	183
Hot banana	828	749	894	870	1,553	979
Total	3,607	3,772	3,988	4,851	5,708	4,386

Source: Ontario Vegetable Growers' Marketing Board.

1. Subject to contract growing

Peppers for processing are grown under contract. An agreement for the marketing of peppers for processing is established annually by negotiation between the Ontario Food Processor's Association and the Ontario Vegetable Growers' Marketing Board, on behalf of the Ontario growers. Any local processor must abide by this agreement. The growers contracting with the processors must in turn comply with certain grading and packaging requirements as noted in Appendix C.

Minimum prices are also established in the agreement. Processors may pay more than the stated minimum, but they may not pay less. Agreed minimum prices for the 1986/1987 seasons are shown in Exhibit V-7.

2. Six primary processors of fresh peppers

Six licensed processors of fresh peppers operate in Ontario. These companies buy products in fresh form from growers according to contract and process them in some way -- most often frozen. These companies, their purchasing preferences and other notes on their operations are shown in Exhibit V-8.

EXHIBIT V-7
Minimum processing prices for peppers as per contract ($ per ton)

	1986	1987
Hot banana type	$272.49	$272.49
Sweet banana type	277.60	277.60
Red bell type:		
- Red only	323.38	323.38
- Red/green (max. 15% red)	264.50	264.50
Multicoloured bell type	202.97	202.97
Green bell type	214.17	214.17

Source: Ontario Vegetable Growers Marketing Board. Agreement for Marketing the 1987 Crop of Peppers.

EXHIBIT V-8
Licensed Ontario processors of fresh peppers

Processor	Popular Varieties	Other
Bick's Pickles	Red bell	- Packed in season - Farmers deliver to Bick's receiving centres
Cobi Foods Inc.	Red and Green	- Freezes and packs - Delivers bulk frozen to processors and institutions
Lakeside Packing Co. Ltd.	Hot & sweet banana Red bell	- Receive in baskets, bulk or totes - Wash, stem & pack in brine
Omstead Foods Ltd.	Red bell	- Freezes for foodservice
Sun-Brite Canning Ltd.	Hot banana	- Received in bulk and processed
Strub Bros. Ltd.	Red bell Hot banana	- Pickles peppers in season

It should also be noted that two other companies -- Pillsbury Canada Limited and Nabisco Brands Limited -- also use peppers. However, these operations use frozen and dehydrated peppers rather than fresh. As a result, neither is licensed, nor are they a party to a contract with growers.

3. Possible opportunity for selected varieties

The quantity of peppers purchased for processing has risen substantially in recent years. The outlook, as reported by processors, is for that trend to continue, though perhaps less rapidly. Demand for certain varieties is expected to outpace others, in particular, red bells and hot banana peppers. These products are said to be enjoying increased popularity in the foodservice trade for Italian and Mexican style foods. However, it should be recognized that the 1986 harvest for hot banana peppers increased by some 80% over the year before. Similarily, red bells increased by 50% over the same two years. These rates of increase cannot be expected to continue.

Another opportunity could be to produce dried or dehydrated peppers, including paprika. At present, all such products are imported with Ontario spice traders having an estimated 1 million pounds of paprika a year. Wholesale prices are in the $1.00 per pound range.

Such products are not manufactured in Canada, we are told, for there are no processing facilities. Given sufficient interest, a drying and milling facility to produce them could possibly be established. It may also be possible for certain other types of pepper products to be processed in Ontario -- for example, condiments -- and to displace like products that are now imported.

VI

SWEET POTATOES

Sweet potatoes have not been grown in commercial quantities in Ontario until this year. This fall, some 36 growers in Southwestern Ontario will harvest their first crop. Based on 30 acres of production, they expect to harvest about 300,000 pounds. This is an experimental venture and as of the time of writing its success remains unknown.

A. A 14 MILLION POUND MARKET

Ontario consumes about 14 million pounds of sweet potatoes each year. All are imported. For the past four years imports have been rising, with the 1986 level running a full one-third above 1983. Exhibit VI-1 shows this.

EXHIBIT VI-1
Imports of sweet potatoes to Ontario (000 lbs.)

1986	14,332
1985	14,335
1984	12,665
1983	10,745

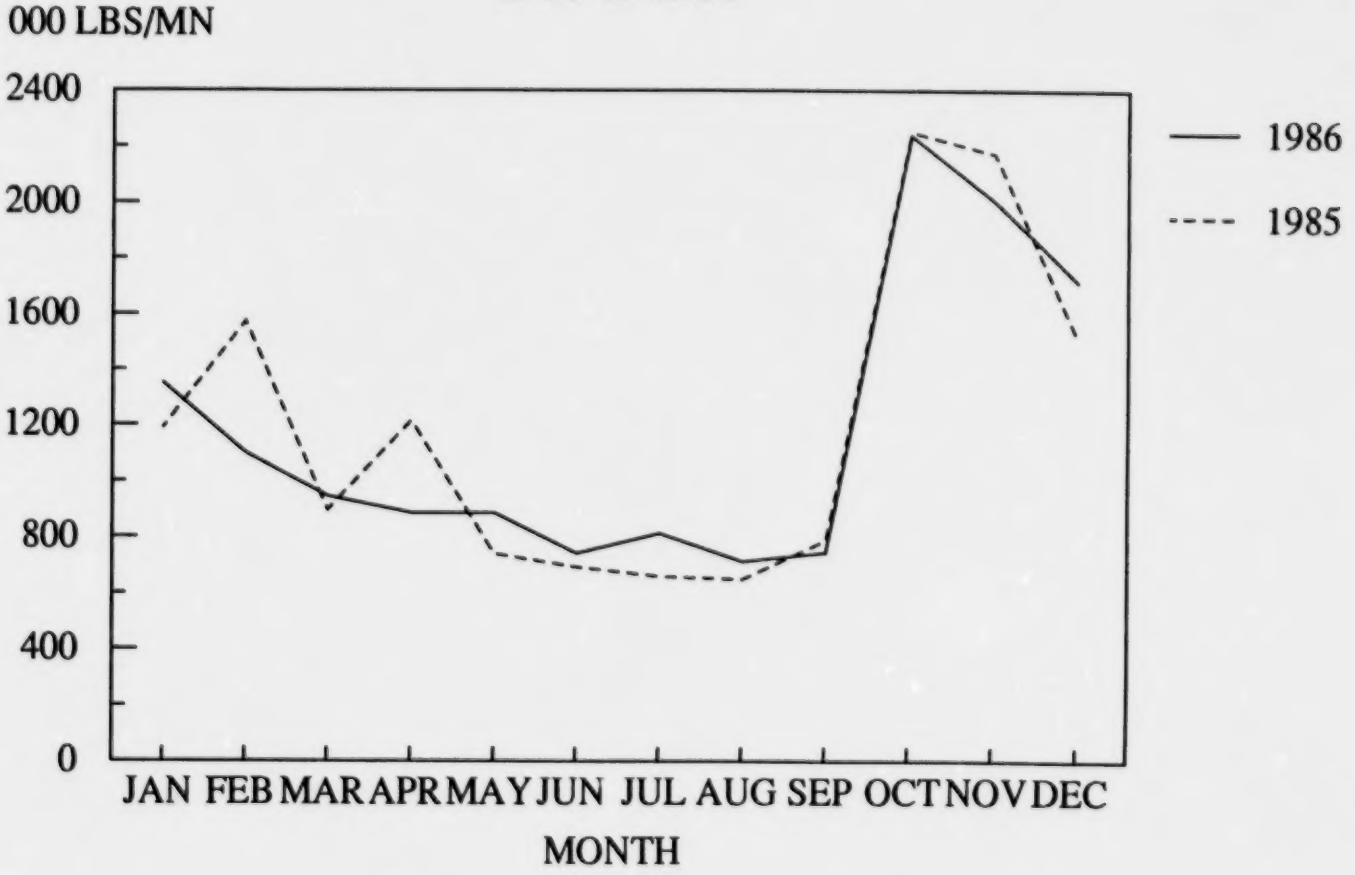
Source: Statistics Canada. External Trade Division.

Imports are highly seasonal. At their lowest during the summer months of May to September, they average 200,000 pounds a week. From October to November, volume more than doubles, averaging 500,000 pounds a week. This is harvest time and the traditional season for serving sweet potatoes, particularly popular as a Thanksgiving and Christmas vegetable. Exhibit V-2 illustrates the pattern.

Of the available supply, some 2 million pounds goes to processing. The remainder, approximately 12 million pounds, is sold fresh. Within the fresh segment in turn, upwards of 90% is reported to be sold at retail, with the restaurant and hotel trade expressing very little interest in the product.

EXHIBIT V1-2

ONTARIO SWEET POTATO IMPORTS
1985 & 1986



Source: Statistics Canada.

B. JEWEL VARIETY FAVOURED BY PROCESSORS

Four Ontario processors use sweet potato. They are:'

- H. J. Heinz Company of Canada Limited.
- Gerber (Canada) Inc.
- Omstead Foods Limited.
- Nabisco Brands Limited.

All express a definite interest in securing a reliable, price-competitive, local supply of sweet potatoes. Of particular interest is the Jewel variety.

The processing industry is accustomed to U.S. grade standards for sweet potatoes. Typically, they want a U.S. number one product. Selected excerpts from the U.S. grade standard for number one sweet potatoes for dicing and pulping are reproduced as Appendix D.

C. RETAILERS WANT AN ATTRACTIVE, CLEAN PRODUCT

The four major retail chains in Ontario report annual sales of 8-10 million pounds of sweet potatoes annually. A further 3 million pounds or so are sold through smaller retailers.

Both independent and chain retailers are open to local source of supply, given certain minimum standards are met. In particular:

- Appearance -- clean, brightly coloured, without scabs or tears.
- Size -- uniformity is key; medium-size preferred.
- Texture -- must be firm, so as to avoid tearing during handling.
- Current U.S. packaging practices have set the standard. 30, 40, or 50 pound waxed cases is the norm.

D. PRICING

Dependable, longer-range price data for sweet potatoes in Ontario is difficult if not impossible to obtain. Being a minor crop, prices are not routinely recorded at the Ontario Food Terminal, nor by Agriculture Canada.

The best available guideline reflects prices reportedly paid to growers by the major retailers at the present time:

- 25¢ a pound for imports from North Carolina; through
- 38¢ a pound for imports from Louisiana.
- 23¢ a pound for Ontario sweet potatoes.

E. AN OPPORTUNITY FOR ONTARIO GROWERS

1. Supply the fresh market

Ontario growers could potentially replace the 12 million pounds of imported sweet potatoes destined for the fresh market. Because all is imported, it would be a net gain to the Ontario agricultural sector. The major retail chains are very interested in the product and would like to secure a local source of supply. Indeed, it even has the potential for promotion: one buyer suggested the product could be packaged in a "mini bag" suitable for prominant display and handling at the retail level.

Indeed, some of the people we spoke with were optimistic about the future of this particular vegetable. We were told that it was considered by many to be a specialty item not subject to widespread availability, and certainly not promoted. And if it were to become more readily availalble from local sources, consumption could rise significantly. Indeed one optimist at the retail level went so far as to predict that consumer tastes would choose the sweet potato as the next "in" vegetable!

2. Processors want a local source of supply

The processing industry in Ontario is a relatively small user of sweet potatoes -- about 2 million pounds per year. Nevertheless, buyers express a strong interest in securing a local source of supply.

Here again, there is considerable optimism about the future of this particular item. This is being driven by new processed products under consideration by processors. Sliced and diced canned sweet potato is one possibility. Snack food items is another, including sweet potato chips. Indeed a new sweet potato snack stick similar in shape to a hot dog, is said to be currently under test in the United States bar trade.

VII

MARKETS FOR FRESH GARLIC

Ontario consumes approximately 2.2 million pounds of fresh garlic a year. Some 95% of this is imported, mainly from California, but also from Mexico and Argentina. The remainder is grown domestically.

A. ONTARIO CROP: 100,000 POUNDS PER YEAR

The commercial production of garlic is a relatively new industry in Ontario. This year, 22 growers planted approximately 40 acres of the crop. They expect to harvest upwards of 100,000 pounds of final product.

At the present time, Ontario is producing mainly a white type of garlic. This crop is harvested in July. Two types are under cultivation:

- Hardneck garlic. Known thus because the hard neck or stem of this bulb pulls away easily, thus separating the cloves.

- Softneck garlic. Despite its name, this type is more durable than hardneck garlic and roots and stems may be trimmed by machine.

There is no organized marketing structure for the sale and distribution of garlic in Ontario. At the present time each grower sells his or her own crop on his own terms. However, we understand that the recently formed Garlic Growers' Association of Ontario is exploring the feasibility of an organized marketing system.

B. MOST IS SOLD WHOLE

Most fresh garlic -- whether imported or grown domestically -- is sold whole. Industry estimates suggest 80% of the 2.2 million pounds consumed is marketed in this form. Product preferences are more or less similar across the retail and foodservice sector. In particular, traders say they want garlic that is:

- Compact -- the cloves of the garlic should fit closely together and remain that way.

- Bright and free from discolouration. The product should be clean, bright white in colour and free from any stains.

- Free of defects and damage. Misshapen or poorly sheathed garlic is unacceptable, as is garlic that has been damaged during harvesting.

- Well-cured. The bulb should not be harvested before it is mature and proper curing is vital if mould is to be avoided.

- Well-packaged. Whole garlic is typically imported in 25 to 40 pound cartons. This is the generally accepted packaging standard. Premium-quality garlic is best marketed loose, rather than in individual packages.

Although garlic is available in a wide range of sizes, size does not appear to be an especially important dimension to the buyer. **Uniformity** of size is more important. Different suppliers use different labels to describe size. For example, U.S. and Mexican garlic is graded according to giant, jumbo, extra jumbo, super jumbo and collosal, to name just a few. Other suppliers use a numbering system. The net effect is confusion.

As to Ontario garlic, there are no official standards. What has evolved in the marketplace is an extension of U.S. standards, the essentials of which are reproduced as Appendix E.

Although size is not a key issue, retail and foodservice preferences differ according to "neck." Retailers tend to prefer softneck because it is more durable and has a longer shelf life. Hardneck garlic is more popular with processors because it has a stronger flavor and may be split apart more easily.

C. "OFF GRADE" GARLIC USED FOR PROCESSING

About one-fifth of the garlic consumed in Ontario is processed. The most common forms are:

- Chopped garlic.

- Garlic spread.

Chopped garlic is true to its name. Primary processors buy whole garlic bulbs. They clean, skin and chop the product and then resell it in pails to institutions, restaurants and hotels. This is not an insignificant business, for in the Toronto area there are four such processors.

Garlic spread is similar. It is a margarine-like product prepared from ground garlic. It is mainly sold for institutional use but some is also sold at retail.

Garlic for processing need not meet the same strict quality demands as the fresh market imposes. Unlike many other vegetables, garlic is not subject to the regulations of the Ontario Vegetable Grower's Marketing Boards' processor agreements. Misshapen and discoloured garlic, within reason, is accepted by processors.

Some processors are already experimenting with Ontario-grown garlic. One Toronto operator used the product this year and found it very acceptable. He indicated to us a willingness to buy as much as 50,000 pounds of the product (one-half of the current production flow) next year, "if the price were right."

D. ONTARIO GARLIC: $1 PER POUND

Over the past year, Ontario garlic has sold for 90¢ to $1.10 per pound wholesale. This is substantially lower than competing garlic from California, Mexico and Argentina where prices range from a low of $1 to a high of more than $2 per pound. Prices are highest for uniformly graded, white garlic. This same premium quality produce is also best marketed loose rather than in individual packages. Conversely, low quality garlic may possibly fetch higher retail prices if it is individually packaged. Exhibit VII-1 and Exhibit VII-2 show wholesale price ranges, by origin and by month for the Ontario season.

EXHIBIT VII-1
Wholesale prices ranges for July 1986-July 1987 ($/lb.)

	Low	High
Ontario	$0.90	$1.10
California	1.00	1.63
Mexico	1.00	2.16
Argentina	1.15	1.84

Source: Toronto trade estimates.

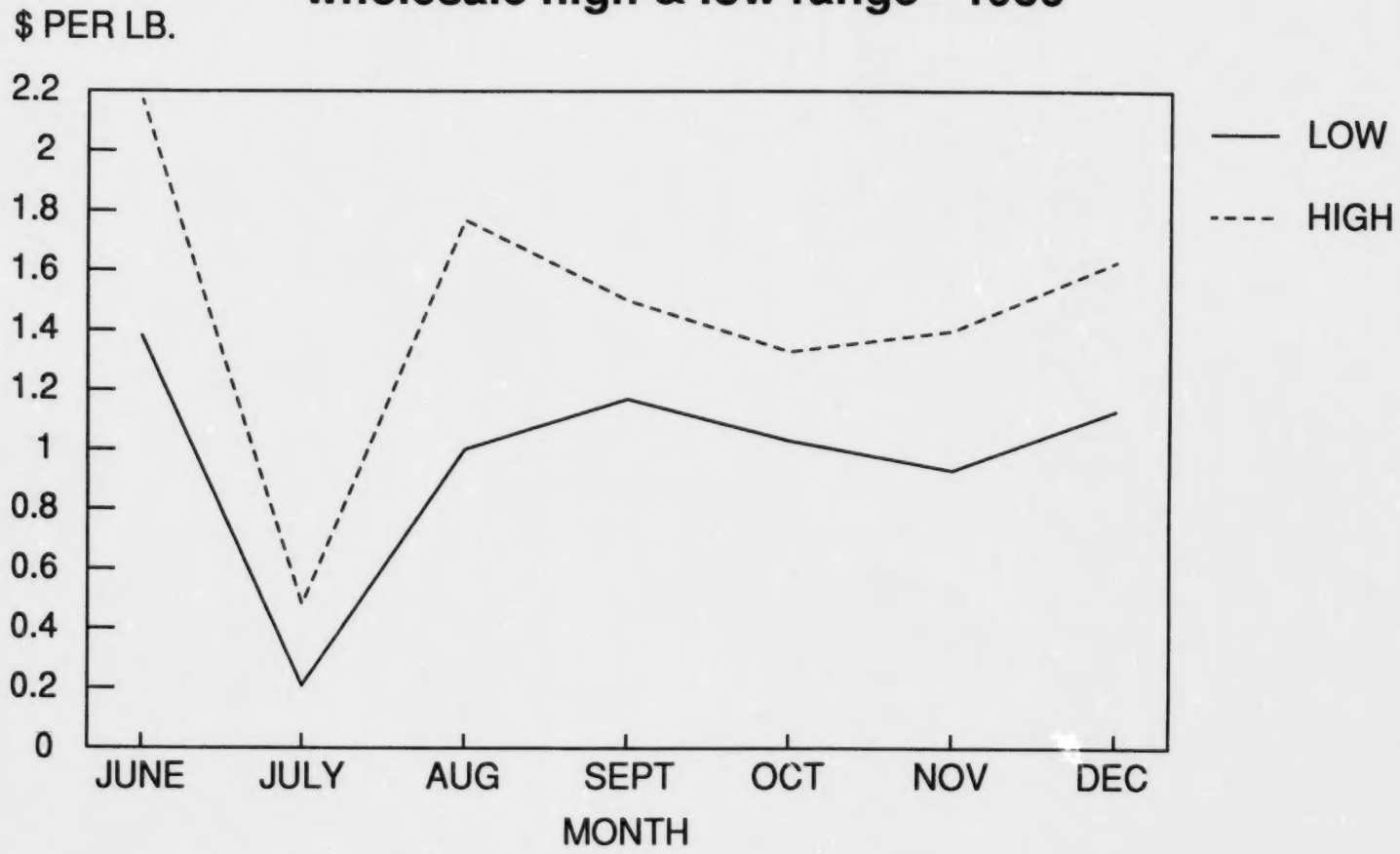
It should be noted that unlike a number of other vegetables, garlic is not currently subject to the jurisdiction of the Ontario Food & Vegetable Marketing Boards.

E. OPPORTUNITY TO MARKET MORE GARLIC

There is a significant opportunity for Ontario growers to market additional quantities of garlic. Ontario production is currently only one-twentieth of the total requirement and further production would help displace imports.

EXHIBIT VII-2

FRESH GARLIC PRICES
wholesale high & low range - 1986



Source: Ontario Food Terminal

Displacement of only 10% of the current fresh import volume would effectively double the current level of production. Were 50% of that volume to be displaced, production could rise to more than a million pounds annually -- an increase of ten-fold. Either scenario could well be feasible. Based on current price levels, growers might expect to operate on a wholesale price in the vicinity of $1 per pound.

Another possible opportunity is to produce dried or dehydrated garlic products. These could include garlic granules and powders. Such products are used by all of the major food processors, including companies such as H. J. Heinz, Bick's, Club House Foods and T.J. Liptons.

All such supplies are current imported, as there is no dehydration capability in Canada. Preliminary estimates suggest that upwards of 2 million pounds of dried garlic is imported annually by these companies. All say that they are willing to consider a local source of supply providing quality and prices are competitive.

Powder is the most popular form of dried garlic used for processing. It is said to currently cost 84¢ a pound landed in Canada. Dehydrated pieces and flakes are also used in substantial quantities.

In summary, garlic offers an opportunity for Ontario growers. It remains to be shown that a quality product can be sold at competitive prices and still yield an acceptable return to growers. Exhibit VII-3 highlights this.

To date, Ontario garlic has sold at a discount to imported garlic. Only when the quality of Ontario product is comparable to that of imported garlic will this price gap be closed.

EXHIBIT VII-3
Opportunities for fresh garlic (lbs.)

	Ontario growers capture	
	10%	50%
Current imports sold as fresh	170,000	850,000
Current imports sold for processing	40,000	200,000
Total	210,000	1,050,000

VIII

CORIANDER, BASIL AND OTHER HERBS AND SPICES

A. OVERVIEW

In 1986, Ontario imported over 6 million pounds of herbs and spices, most in dried or dehydrated form. This represents a 27% increase over the previous year and is indicative of a significant growth potential in this market.

While country specific data are unavailable for Ontario, Statistics Canada reports that the nation as a whole imports herbs and spices from over 50 countries. However, three of these supply more than 50% of the total: The United States, India and Indonesia. The United States is by far the largest as shown in Exhibit VIII-1.

EXHIBIT VIII-1
Canadian imports of herbs and spices, 1985

Country	(000 lbs.)	% of total
United States	2,524	28
India	1,325	15
Indonesia	880	10
Turkey	626	7
Morrocco	368	4
Peoples Republic of China	357	4
France	342	4
Netherlands	298	3
United Kingdom	265	2
Other countries	265	2
Total	8,865	100

Source: Statistics Canada.

Import quantities for individual herbs and spices are, with only isolated exceptions, unavailable. Those exceptions do not, unfortunately, include coriander, basil, dill or paprika. This information is simply not captured by Statistics Canada or through any other comprehensive mechanism.

1. Product forms

Herbs and spices are sold in three main forms:

- Fresh.
- Oils, resins and extracts.
- Dried, which includes a range of powders and dehydrated blends.

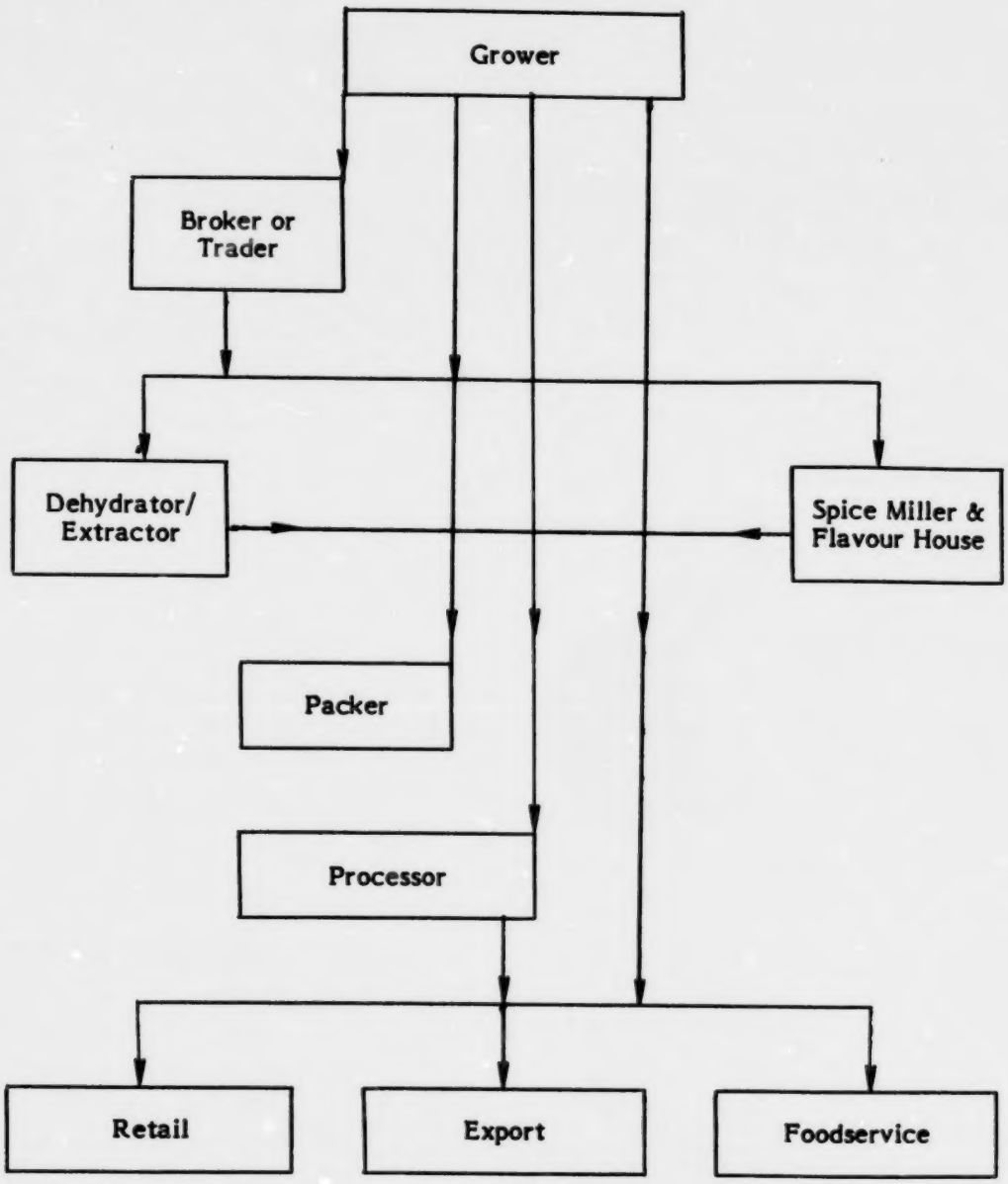
There are no statutory grade standards for herbs and spices in Canada. Local processors make use of U.S. grade standards and product definitions. In particular, they refer to U.S. herb and spice specifications, as defined by the U.S. Department of Agriculture. A copy of the relevant sections is reproduced as Appendix F.

2. Buyers and distribution channels

Herbs and spices reach their ultimate destination in a variety of different ways. On route from grower to end-user its visible characteristics may be transformed and ownership change hands more than once. The main ways in which this happens are illustrated in Exhibit VIII-2. Some of the less obvious participants in this chain are:

- **Dehydrator or extractor.** A primary processor which buys the raw herbs or spices in either fresh or dried form. The fresh product is either dried or processed to extract its oils and resins. Dried product is subject to a similar process. Companies in this business include P.P.F. International and Cobi Foods, Inc.
- **Spice millers and flavour houses.** These processors blend herbs and spices to make a range of product mixes and flavours. They may buy fresh or dried product, then clean and grind it. They may also buy some of their requirements from dehydrators and extractors. Companies in this business include Griffith Laboratories and Loretta Foods.
- **Packers.** These companies are in the business of packing herbs and spices in bottles and cans ready for sale to retail or to the foodservice trade. They may buy either fresh seeds ready for packing or dried or otherwise prepared product from a miller or dehydrator. The principal packers in Ontario are Club House Foods and the Blue Ribbon Division of T. J. Lipton.

EXHIBIT VIII-2
Channels of distribution for herbs and spices



- **Processors.** These are companies, such as H. J. Heinz Company of Canada Limited or Bick's (Canada) Limited, that incorporate herbs and spices in the products they manufacture.

B. MARKET FOR BASIL

Basil, or sweet basil as it is often known, is one of the more popular herbs and spices. Although specific data are unavailable, we tentatively estimate Ontario's requirements at about 200,000 pounds annually. Most is used for processing purposes.

The major portion of Ontario's requirements comes from Egypt. Lesser quantities are imported from California. Prices vary widely according to quality and origin. As of September this year, ordinary quality Egyptian basil was quoted at wholesale at 67¢ per pound. Similar quotations for premium quality Californian basil ranged up to $5.35 per pound. Exhibit VIII-3 shows this.

EXHIBIT VIII-3
Selected wholesale price quotations, September 4, 1987

Basil	
► Egypt	
- FAQ (ordinary)	.67
- Fancy	.92
- Extra Fancy	1.05
- Recleaned[1]	1.32
► California (coarse)	4.60 - 5.35
► France	1.20 - 1.33

Source: Wholesale Price Lists.

[1]Recleaned after import and ready for packing.

1. Processors concerned with cleanliness and flavour content

Processors want a product that is free from dirt, twigs and stems. It must also satisfy a number of other requirements as noted below:

- Product -- air dried with the leaves in either whole or ground form.

- Colour -- Green not brown.
- Oil -- 2% to 3%.
- Aroma -- sweet, pleasant, ideally similar to Californian product.

2. Opportunity for import displacement

Currently, almost all basil is imported, though not in raw or fresh form, most is dried. By offering a comparable product, Canadian growers could usurp this business. However, quantities are not particularly large. Total imports are estimated to be 200,000 pounds yearly. For Ontario growers to capture 10% of this, the volume would be a mere 20,000 pounds. Based on a 50% market share, the figure could be as high as 100,000 pounds.

Price levels attained will be a direct function of the characertistics and quality of the product grown. Based on current wholesale prices for Egyptian-type product, returns to the grower would likely be less than 30¢ per pound (net dry weight). If, however, Ontario were to offer a California-type basil, prices to growers could be $2.00 to $3.00 per pound (net dry weight) or more.

C. MARKET FOR CORIANDER

There are two forms of coriander:

- The fresh plant, sometimes called cilantro or chinese parsley. It is commonly used in soups or eaten as a boiled vegetable.
- Coriander seed, a pungent spice and ingredient in curry and other similar foods.

1. Cilantro gaining popularity in the foodservice trade

Cilantro was introduced to North American in the late 1970's by immigrant Vietnamese. It has a small but loyal following in the hotel and restaurant trade.

Ontario growers produced about 50,000 pounds of cilantro this season. It is reported to have sold quickly at 38¢ to 42¢ per pound to the growers. Attempts to sell the product at retail had been unsuccessful so far.

People we spoke with saw an opportunity for increased production. Although the market will remain small for the foreseeable future, some suggested that as much as four times the current quantity could be absorbed without placing any undue downward pressure on price.

2. Coriander seed can be sold at a price

Coriander is a popular spice. Although specific data are unavailable, there is evidence that Ontario imports about 500,000 pounds of the product annually and demand is said to be increasing.

Prices are very competitive. Most is imported from Morocco at a landed price of 35¢ a pound, but can range from 30¢-50¢. Over two-thirds of all imports are consumed by the processing sector. They seek a product which satisfies the following requirements:

- Product -- whole, ground or cracked.
- Colour -- light tan, not dark.
- Oil -- high oil content for strong aroma.

Ontario processors are willing to consider a local source of supply. Indeed, some say that they would even be willing to pay a small premium to secure a local source of supply. One trader we spoke with also saw an export opportunity -- as much as 200,000 lbs. per year.

3. Summary of opportunities

Ontario growers could sell additional quantities of both cilantro and coriander seed. Fresh coriander is only consumed in small quantities and growth potential will largely depend on the rate at which the product becomes more popular. As to coriander seed, most is now imported.

An opportunity exists to grow additional quantities of cilantro, perhaps as much as an additional 150,000 pounds. Prices could be in the 40¢ per pound range.

Opportunities for coriander seed largely depend on the extent to which Ontario growers capture a share of the current import business. Based on scenarios of 10% and 50% import replacement, potential volumes would be in the 50,000 to 250,000 pound range. Prices could be in the 30¢ to 40¢ per pound range, based on current levels. Also, growers may also be able to export coriander, given they meet world seed prices.

D. MARKET FOR DILL

Dill is sold in two main forms:

- Dill weed.
- Dill seed.

Both dill weed and dill seed are used by the food processing industry. They are also sold for home consumption. The major use is in pickling, for example, as an ingredient in dill pickles.

1. Major processors already use local dill weed

Ontario food processors use an estimated 150,000 pounds of fresh dill weed annually. Most, if not all, is currently being supplied by Ontario growers. Indeed we were told that one grower was able to satisfy the requirements of four major processors (H. J. Heinz Company of Canada Limited, Bick's (Canada) Limited, Strub Bros. Limited and E.D. Smith Ltd.) from a planting on 7-1/2 acres of land.

More importantly, prices are very low and flat. One grower reported that he had sold his crop fresh at 11¢ per pound for the past six years. And, there is a surplus of supply: we were told of crops being plowed under for want of a market, even at this price or lower.

2. Specialty item in the foodservice trade

Hotel and restaurant use of fresh dill weed is small relative to weed use in processing. Foodservice brokers we spoke with carry fresh, Ontario-grown dill weed when in season as a specialty item. Current local production seems to satisfy requirements.

3. Opportunity for dried dill

Ontario growers could potentially sell both dill weed and dill seed, in dried form, to spice packers. Packers currently import about 30,000 pounds of dried weed, mainly from Europe and California. Wholesale prices range from $2.00 to $6.50 per pound. Based on scenarios of 10% and 50% import replacement, potential volumes would be in the 3,000 to 15,000 pound range. With an average wholesale price of $4.25 per pound, this represents a potential value of $12,000 to $65,000 for dill weed.

Dill seed replacement offers greater volume, but it is a lower value product. Packers import upwards of 100,000 pounds of dill seed a year. Most comes from India, at a wholesale price in the 42¢ to 90¢ per pound range. Import replacement scenarios of 10% and 50% suggest that potential volumes would be in the 10,000 to 50,000 pound range. Based on an average wholesale price of 60¢ per pound, potential replacement value is very low, ranging from $5,000 to $45,000.

Appendix A

BEAN GRADES

(CANADIAN GRAIN COMMISSION STANDARDS)

BEANS (Canada)

FOR THE CLASSES CRANBERRY, BLACKEYE OR YELLOWEYE

The class name shall be added to and become part of the grade name

Grade Name	Standard of Quality	Maximum Limits of					
		Foreign Material		Damage, Contrasting Classes of Beans	Foreign Material and Contrasting Classes	Total Damage Including Splits, Foreign Material and Contrasting Classes	Other Classes of Beans that Blend
		*Stones, Shale or Similar Material	Total Foreign Material				
Extra No. 1 Canada	Well screened and picked, uniform in size, of good natural colour	Free	About 0.05%	1.0%	1.0%	1.0%	1.0%
No. 1 Canada	Well screened and picked, of reasonably good colour	About 0.05%	About 0.1%	1.5%	1.5%	3.5%	3.0%
No. 2 Canada	Reasonably well screened and picked, of reasonably good colour	About 0.1%	About 0.2%	3.0%	3.0%	5.5%	5.0%
No. 3 Canada	Fairly well screened and picked, of fairly good colour	About 0.2%	About 0.5%	5.0%	5.0%	7.5%	10.0%
No. 4 Canada	Off colour	About 0.5%	1.0%	8.5%	8.5%	10.0%	15.0%
Final Grade Name		Over grade tolerance up to 2.5% grade Beans, Rejected "grade" "class" Account Stones. Over 2.5% grade Beans, Sample Salvage	Over 1.0% grade Beans, Sample Canada "class" Account Admixture	Over 8.5% grade Beans, Sample Canada "class" Account Contrasting Classes	Over 8.5% grade Beans, Sample Canada "class" Account Reason	Over 10.0% grade Beans, Sample Canada "class" Account Reason	Over 15.0% grade Beans, Sample Canada "class" Account Other Classes That Blend

Grade Name	Ergot	Sclerotinia	Heated or Rotted	Mouldy
Extra No. 1 Canada	0.05%	0.05%	Free	Free
No. 1 Canada	0.05%	0.05%	Free	Free
No. 2 Canada	0.05%	0.05%	Free	Free
No. 3 Canada	0.05%	0.05%	Free	3K
No. 4 Canada	0.05%	0.05%	1.0%	1.0%
Final Grade Name	Over 0.05% grade Beans, Sample Canada "class" Account Ergot	Over 0.05% grade Beans, Sample Canada "class" Account Admixture	Over 1.0% grade Beans, Sample Canada "class" Account Heated	Over 1.0% grade Beans, Sample Canada "class" Account Mouldy Kernels

*For Eastern grain see Appendix A - Definitions: Stones

NOTE: THE LETTER "K" IN THESE TABLES REFERS TO KERNELS OR KERNEL SIZE PIECES IN 500 GRAMS

BEANS (Canada)

FOR THE CLASSES OTHER THAN CRANBERRY, BLACKEYE OR YELLOWEYE

The class name shall be added to and become part of the grade name

Grade Name	Standard of Quality	Maximum Limits of					
		Foreign Material					
		*Stones, Shale or Similar Material	Total Foreign Material	Contrasting Classes of Beans	Damage, Foreign Material and Contrasting Classes	Total Damage Including Splits, Foreign Material and Contrasting Classes	Other Classes of Beans that Blend
Extra No. 1 Canada	Well screened and picked, uniform in size, of good natural colour	Free	About 0.05%	1.0%	1.0%	1.0%	1.0%
No. 1 Canada	Well screened and picked of reasonably good colour	About 0.05%	About 0.1%	1.5%	1.5%	2.0%	3.0%
No. 2 Canada	Reasonably well screened and picked, of reasonably good colour	About 0.1%	About 0.2%	3.0%	3.0%	4.0%	5.0%
No. 3 Canada	Fairly well screened and picked, of fairly good colour	About 0.2%	About 0.5%	5.0%	5.0%	6.0%	10.0%
No. 4 Canada	Off colour	About 0.5%	1.0%	8.5%	8.5%	10.0%	15.0%
Final Grade Name		Over grade tolerance up to 2.5% grade Beans, Rejected "grade" "class" Account Stones. Over 2.5% grade Beans, Sample Salvage	Over 1.0% grade Beans, Sample Canada "class" Account Admixture	Over 8.5% grade Beans, Sample Canada "class" Account Contrasting Classes	Over 8.5% grade Beans, Sample Canada "class" Account Reason	Over 10.0% grade Beans, Sample Canada "class" Account Reason	Over 15.0% grade Beans, Sample Canada "class" Account Other Classes That Blend

Grade Name	Ergot	Sclerotinia	Heated or Rotted	Mouldy
Extra No. 1 Canada	0.05%	0.05%	Free	Free
No. 1 Canada	0.05%	0.05%	Free	Free
No. 2 Canada	0.05%	0.05%	Free	Free
No. 3 Canada	0.05%	0.05%	Free	3K
No. 4 Canada	0.05%	0.05%	1.0%	1.0%
Final Grade Name	Over 0.05% grade Beans, Sample Canada "class" Account Ergot	Over 0.05% grade Beans, Sample Canada "class" Account Admixture	Over 1.0% grade Beans, Sample Canada "class" Account Heated	Over 1.0% grade Beans, Sample Canada "class" Account Mouldy Kernels

*For Eastern grain see Appendix A - Definitions: Stones

NOTE: THE LETTER "K" IN THESE TABLES REFERS TO KERNELS OR KERNEL SIZE PIECES IN 500 GRAMS

Appendix B

GRADING STANDARDS FOR FRESH TOMATOES

(ONTARIO MINISTRY OF AGRICULTURE AND FOOD)

GRADES

The grades for field tomatoes in Ontario are: Canada No. 1, Canada No. 2, Canada No. 1 Picklers and Canada No. 2 Picklers. All Field tomatoes sold in Ontario must be packed to one of these grade standards and be marked accordingly. The following table compares the requirements of Canada No. 1 Grade, and Canada No. 2. The "Picklers" grades provide for the sale of immature, green tomatoes during the months of September and October provided that, with the exception of maturity, they conform to all of the other grade requirements for Canada No. 1 or Canada No. 2.

GRADE FACTORS	CANADA NO. 1 GRADE	CANADA NO. 2 GRADE
CONDITION	SOUND - means tomatoes must be free from: 1) decay or breakdown - any soft mushy condition 2) freezing injury - any water soaked, glazed areas 3) soft or overripe - yields to moderate pressure 4) shrivelled - wrinkled 5) any injury or defect affecting the appearance, edibility or shipping quality	
MATURITY	"Mature", in respect of a tomato, means a tomato that is fully developed, well filled out, gives a feeling of springiness and pliability when pressure is applied, is bright and waxy in appearance, has seeds that are well developed and seed colour that shows at least a definite break from a green to a straw ground colour;	
UNIFORMITY OF MATURITY	Tomatoes packed in containers must be within one of the following stages of maturity: (a) mature - as per description of maturity (b) turning - tinge of pink at blossom end to 25% of surface of pink or red colour (c) semi-ripe - minimum of 25% to a maximum of 75% of surface of pink or red colour (d) firm-ripe - pink or red colour covering at least 75% of the surface SPECIAL TOLERANCE 10% of the tomatoes in each package may meet the requirements of one of the adjacent maturity stages and still meet grade. e.g. 5% turning 90% semi-ripe 5% firm-ripe	

GRADE FACTOR	CANADA NO. 1 GRADE	CANADA NO. 2 GRADE
VARIETY	Each container must contain tomatoes of similar varietal characteristics or type e.g. - pear or plum type cannot be mixed with round or flat types	
SHAPE	Must be free from ridged, angular or indented tomatoes whose appearance is materially affected - the affected portion may not exceed 5% cut-off No spurs allowed.	May not be so misshapen or deformed as to seriously affect the tomato's appearance - the affected portion may not exceed 10% cut-off. No spurs allowed.
SIZE	Round type - 1) minimum diameter of 2 inches 2) the diameter variation in a closed container may not exceed 1 inch (one off-size specimen per container is permitted) 3) undersize tomatoes whose diameter ranges from 1½ to 2 inches may be sold provided that the container is marked with either the word "small" or the range "1½ - 2 inches" Plum or Pear Type - - minimum diameter of 1¼ inches Note - Diameter is measured at the widest cross section taken at right angles to the longest axis	Round Type - - minimum diameter of 1 3/4 inches Plum or Pear Type - - minimum diameter of 1¼ inches

GRADE FACTOR	CANADA NO. 1 GRADE	CANADA NO. 2 GRADE
APPEARANCE	Must be clean - meaning free from - 1) thickly smeared foreign matter, spray residue, dirt, etc. that exceeds an aggregate area of ¼ of an inch in diameter 2) lightly smeared foreign matter that affects an aggregate area of 3/4 of an inch	Must be reasonably clean - meaning free from - 1) thickly smeared foreign matter, spray residue, dirt etc. that exceeds an aggregate area of ½ of an inch in diameter 2) lightly smeared foreign matter that affects an aggregate area of 1¼ inches in diameter
DISEASE	Free from disease including Alternaria rot, Anthracnose, Blight and Blossom End Rot	
SUN SCALD	Free from any whitish, shiny, blistered areas	Free from sunken, discoloured and wrinkled areas that seriously affect appearance, edibiity or shipping quality

GRADE FACTOR	CANADA NO. 1 GRADE	CANADA NO. 2 GRADE
BLOTCHY RIPENING OR GREY WALL	Free from - 1) any browning of the vascular bundles of the cell wall 2) hard greenish-yellow waxy or glossy areas Note - - do not confuse this defect with uneven ripening which has a similar yellow colour but is not accompanied by a glossy appearance or internal browning	Free from blotchy ripening that exceeds 15% of the surface of the tomato in aggregate area
BACTERIAL SPECK	- Free from cinder-like scabs which affect the flesh - - Up to 5 black specks are allowed providing each is only slightly raised, and is not greater than 1/32 of an inch in diameter	- Up to 25 black specks are allowed providing each speck is only slightly raised and is not greater in diameter than 1/16 of an inch
GROWTH CRACKS	Free from - 1) any growth cracks that are not well healed 2) any growth cracks that extend over the shoulder of the tomato 3) cracks that show black discolouration caused by breakdown 4) radial cracks whose aggregate length exceed 3/4 of an inch 5) any concentric crack outside of a circle 1¼ inch in diameter 6) concentric cracks whose aggregate length is greater than 4 inches disregard well healed growth cracks within ¼ inch of stem scar)	Free from - 1) cracks that are not well healed 2) cracks that extend over the shoulder 3) cracks that show black discolouration caused by breakdown

GRADE FACTOR	CANADA NO. 1 GRADE	CANADA NO. 2 GRADE
SKIN BREAKS	Free from - any open, wet cracks or skin punctures	Free from - any open wet cracks or skin punctures
BRUISING	Free from bruises - 1) that are soft 2) that are discoloured	Free from bruises - 1) that are soft 2) that are discoloured and in aggregate, cover an area greater than 5% of the surface
PUFFINESS	Free from - internal cell separation where - 1) the open space in the seed cavity exceeds ¼ the thickness of the outer wall 2) more than ¼ of the cells are affected Measurement should be taken on a general line of the cell wall and not from any small indentation where the cell wall has flattened.	Free from - internal cell separation where the open space in the seed cavity exceeds the thickness of the outer wall (any amount of cells may be affected)
PLANT OR STEM RUB	Free from injury that in aggregate exceeds an area greater than ¼ inch in diameter	Free from injury that in aggregate exceeds an area greater than 1 inch in diameter
SAND BLASTING	Free from - 1) netting that is rough 2) smooth netting greater than ¼ inch in diameter	Free from - 1) netting that is rough 2) netting greater than 1 inch in diameter.
INSECT INJURY	Free from injury that - 1) exceeds two well healed stings per tomato 2) is not well healed	Free from - 1) stings that are not well healed 2) injury that in aggregate exceeds an area greater than ¼ the diameter of the tomato

GRADE FACTOR	CANADA NO. 1 GRADE	CANADA NO. 2 GRADE
BLOSSOM END SCARS	Free from scars that - 1) are not reasonably smooth 2) have deep holes 3) are greater in diameter than ¼ the diameter of the tomato	Free from scars that - 1) are rough or indented 2) exceeds 5% of the surface of the tomato
STITCHING	Free from "stitching" that is - 1) rough 2) accompanied by holes 3) fine and exceeds the length of one line from stem to blossom end in aggregate	Free from "stitching" that - 1) that exceeds the length of two lines from stem to blossom end in the aggregate 2) has holes penetrating into the tomato
HAIL INJURY	Free from any visible Hail Marks	Free from - 1) any marks that have broken the skin 2) marks exceeding an aggregate area ½ the diameter of a fruit
GROUND SPOTS	Free from - 1) any soft or dark discoloured areas 2) firm, light tan coloured areas that in aggregate exceed ½ the diameter of the tomato	Free from - 1) any soft or dark discoloured areas 2) firm, light tan coloured areas that in aggregate exceed ½ the diameter of the tomato
OTHER DEFECTS	Free from any other injury or defect that materially affect the appearance, edibility, or shipping quality. "Materially affects" means damage in excess of ¼ the diameter of the tomato	Free from any other injury or defect that seriously affect the appearance, edibility or shipping quality. "Seriously affects" - means damage in excess of ½ the diameter of the tomato

PROPERLY PACKED

When packaged, the produce may not be slack, overpressed or otherwise in a condition likely to result in permanent damage during handling or in transit.

PACKING LEVEL TOLERANCES

Size: (a) 5% of the field tomatoes by count may be below the minimum size
(b) 5% of the field tomatoes by count may be above the maximum size
(c) 10% of the packages, when the field tomatoes are in packages, may contain field tomatoes that exceed the permitted size variation

Grade Defects:

(a) 3% of the field tomatoes by count may be affected by soft areas, water blisters, open wet cracks or decay
(b) 5% of the field tomatoes by count may have the same grade defect
(c) a maximum of 10% of the field tomatoes by count may have defects of any kind including decay (but not including size which is a completely separate tolerance)

ADDITIONAL DESTINATION TOLERANCES

In addition to those tolerances permitted at shipping point, another 5% of the field tomatoes by count may have defects (of which not more than 2% may be decay) at any other subsequent level of trade. Condition defects are those which can worsen after packing (i.e.) decay, shrivelling, freezing, etc.

Examples of Maximum Tolerances

(i) Packing Level

5% undersize
5% oversize
1% decay
2% wet open cracks
3% growth cracks
2% sun scald
2% bruising

20% TOTAL

(ii) Destination

5% undersize
5% oversize
3% decay
3% wet open cracks
3% growth cracks
2% sunscald
5% bruising

25% TOTAL

MARKINGS

All containers of tomatoes must be marked with the following:

(i) name and address of packer
(ii) grade with Canada prefix and (size if required) - (i.e. Canada No. 1 - 1¼" - 2") Canada No. 1 Small
(iii) country of origin or Canadian province of origin in the form of "Product of _____"
(iv) the word tomatoes where the product is not visible

Note:

(a) the grade and origin markings must be immediately adjacent to one another and of the same size print
(b) net weight of contents should be marked on baskets, cartons, boxes or crates when sold on a weight basis
(c) marks for cartons of half-bushel and bushel capacity shall include the capacity in letters and figures not less than ½ inch in height - include baskets of 4 qt. 6 qt. 11 qt. and 4 litre
(d) other required markings must be of print at least 1/8 of an inch in height on tags, 3/16 inch on bags, and 1/4 inch in height on all other packages
(e) all markings must be legible, of a permanent nature, and of a size reasonable in proportion to the package or label

PACKAGES

Field tomatoes may be packed in the following containers:

- trays, cartons, boxes, crates - 1, 2, 3, 5, 8 and 10 pounds and multiples of 5 pounds
- baskets - 1 qt. 2 qt. 4 qt. 6 qt. 11 qt. 4 litre
- tomato tubes - minimum net weight of 14 ounces
- crates or lugs - 16 1/8 inch x 13 1/2 inch x 6 1/2 inch
- any other container which is standard or authorized in the regulations

BILINGUAL REQUIREMENTS

All markings on packages must under federal law be printed in equal prominence in both English and French

"Grade" translates "Categorie" i.e. Canada No. 1 Grade - "Categorie Canada #1"
"Field tomatoes" translates "Tomates de Grande Culture" or "Tomatoes" translates "Tomates"

METRIC

At the time of printing, all net quantity markings must under federal law be printed in the imperial measure (pounds, etc.) with the equivalent metric measure in the same size of print

A timetable for complete conversion to metric containers for the produce industry has not been established

Note:

For further information on bilingual markings or for shipments out of Ontario contact your local inspector with Agriculture Canada

For other grading, packing or marking information contact your local inspector, Fruit and Vegetable Inspection Branch of the Ontario Ministry of Agriculture and Food.

For accurate reference, recourse should be made to the official volumes.

July 1987

Appendix C

GRADING AND PACKING SUMMARY FOR FRESH PEPPERS

GRADE - PEPPERS

The grade for peppers in Ontario is Ontario No. 1 under Regulation 332/80 as there are not any Federal grades established for peppers.

GRADE FACTOR	Ontario No. 1
VARIETY	Similar varietal characteristics, same general type and shape.
CONDITION	Firm - not soft or shrivelled. (Score when specimens show obvious wrinkling.)
BRUISES	Free from bruises. (Scored when the aggregate area exceeds 3/4") Mechanical injury. (Includes crushing and splitting which is scored when the cracks extend beyond pepper wall.)
DECAY	Free from. (Includes both stem and edible portion.)
INSECTS	Free from insect or insect larva. Free from insect injury.
OTHER DEFECTS	Free from any damage, injury, or defect or combination thereof that materially affects their appearance, edibility or shipping quality (including shape).

PROPERLY PACKED — When packaged the produce may not be slack, overpressed or otherwise in a condition likely to result in permanent damage during handling or in transit.

PACKAGING LEVEL TOLERANCES

Decay - 3% of the peppers by count may be affected by decay.

PACKAGES - Produce may be packed in the following standard containers

- baskets - 2, 4, 6, 8, 11 quarts and 2 and 4 litre.
- half bushel, cartons, boxes - 1110 cu. inches.
- one bushel, cartons, boxes - 2220 cu. inches.
- and/or any standard or experimentally authorized containers.

BILINGUAL REQUIREMENTS

All markings on packages should be printed in equal prominence in both English and French. Grade translates "Categorie" i.e. Canada No. 1 Grade - Categorie Canada # 1 (as there is a possibility of export from Ontario). "Names and Addresses" are required only once.

METRIC

At the time of printing (spring 1987) all the quantity markings, must under federal law, be printed in the imperial measure (pounds, quarts, etc.) with the equivalent metric measure in the same size of print (except 2 L and 4 L baskets).
(ie. 3 lbs - 1.36 kg)
(4 qts - 4.54 L)
A timetable for complete conversion to metric containers for the produce industry has not been established.

NOTE

For further information on bilingual markings or for shipments out of Ontario contact your local inspector with Agriculture Canada.
For grading, packing or marking information contact your local inspector, Fruit and Vegetable Inspection Branch of the Ontario Ministry of Agriculture and Food.

GRADING AND SAMPLING FOR PROCESSING PEPPERS

1. All peppers received:

   a) Shall be fully matured, well-formed, sound, picked with stems on, but free of leaves and of the same type or variety.

   b) Specific to type as follows:

      Banana type: fully matured, minimum 5" in length; colour - 25% red, 75% yellow; no green; reasonably straight.

      Green bells: fully matured: 2-3/4" minimum diameter; totally green; 5% tolerance on colour per load.

      Red bells: fully matured 2-3/4" minimum diameter; totally red; 10% tolerance on colour per load.

      Multicoloured bell type: fully matured 2-3/4", minimum diameter; average 50% green and 50% red; 5% tolerance on colour per load.

   c) Shall be free of disease, damage, decay, cracks and shall not be frozen, unsound, over-ripe, undersized, deformed, sunburnt or shriveled, nor have insect residue. A tolerance of 5% will be allowed on any single defect listed in this clause and 10% allowed on any combination of defects listed in this clause.

   d) If a load of peppers delivered exceeds the allowable colour tolerances specified in Clause 1b), the processor may deduct the amount by which the tolerance is exceeded. Should the off colour per load including the tolerance exceed 10% for green bells; 15% for red bells and; 10% for multicoloured bell type the processor has the option to receive or reject the load.

   e) If a load of peppers delivered exceeds the allowable tolerances specified in Clause 1c) the processor may deduct the amount by which the tolerance is exceeded. Should the total defects per load including the tolerances exceed 15% of the load, the processor has the option to receive or reject the load.

2. a) All notices regarding restrictions of delivery shall be made by the processor at least 48 hours or two delivery days in advance to the grower.

   b) All notices regarding termination of delivery shall be made by the processor at least five days in advance to the grower.

c) A grower may sell his peppers to any other licensed processor, person or corporation immediately after receiving a release from further deliveries. The grower is subject to recall if the processor requires additional peppers.

Source: Ontario Vegetable Growers' Marketing Board.

Appendix D

U.S. DEPARTMENT OF AGRICULTURE EXTRACT FROM "SWEETPOTATOES MARKET INSPECTION INSTRUCTIONS"

AND

U.S. STANDARDS FOR SWEETPOTATO DICING OR PULPING

GENERAL EXAMPLES

(1) U. S. Extra No. 1.

Size: Generally 1-3/4 to 3-1/4, mostly 2-1/4 to 3 inches in diameter; from 3 to 9, mostly 4-1/2 to 8 inches in length; and 4 to 18 ounces in weight. Off-size within tolerance.

Quality: Generally clean, mostly well, some fairly well shaped, smooth, uniform color, fairly bright to bright. Grade defects within tolerance.

Condition: Generally firm. Average 3% decay, including 1% soft rot, (or "Average 2% dry rot, 1% soft rot").

Grade: U. S. Extra No. 1.

Remarks: Inspection and certificate restricted to product in 2 upper layers of load.

(2) Now fails to grade U. S. No. 1 account condition factors. Percentage of U. S. No. 1 quality reported.

Size: Generally 1-3/4 to 3-1/2, mostly 2-1/2 to 3-1/4 inches in diameter; from 3 to 9, mostly 4 to 7-1/2 inches in length; and 4 to 20 ounces in weight. Average 6% off-size, including 4% undersize.

Quality: Generally fairly well to well shaped, fairly clean, mostly fairly smooth, many smooth, fairly uniform color. Grade defects average 5%, mostly cuts and insect damage.

Condition: Generally firm. From 1 to 3%, average 2% Black Rot. From 1 to 9%, average 6% soft rot, Rhizopus Rot, generally in early stages. Most sweetpotatoes show sprouts from 1/2 to 1-1/2 inches in length, including from 5 to 22% average 17% showing sprouts over 3/4 inch in length.

Grade: Meets quality requirements but fails to grade U. S. No. 1 only account condition; now averages approximately 75% U. S. No. 1 quality, 6% soft rot.

Remarks: Inspection and certificate restricted to product in 4 stacks nearest rear of trailer. Percentage of U. S. No. 1 quality reported at applicant's request.

(NOTE: The percentage of U. S. No. 1 quality reported under Grade is calculated as follows: 6% off-size, 5% permanent defects, 8% decay (Black Rot and soft rot), 7% sprouts (17% minus 10% allowable) = 26%.)

(3) Fails to grade U. S. No. 1 account off-size and defects.

Size: Generally 1-3/4 to 3-3/4, mostly 2-1/4 to 3-1/2 inches in diameter; from 3 to 9, mostly 4 to 8 inches in length; and 4 to 20 ounces in weight. Off-size ranges from 4 to 21% average 16%, including 14% oversize.

Quality: Smooth to fairly smooth, well to fairly well shaped, fairly uniform color, most samples fairly clean, many slightly dirty. Other grade defects average 4%, cuts and insect damage.

Condition: Generally firm. Average 1% decay. From 2 to 6%, average 3% damaged by slightly sunken, discolored areas.

Grade: Fails to grade U. S. No. 1 account off-size and defects.

(4) U. S. No. 2.

Size: Generally 1-1/2 to 4-1/2, mostly 2-1/2 to 3-3/4 inches in diameter; from 2-1/2 to 12, mostly 5 to 10 inches in length; and 3 to 36 ounces in weight. Off-size within tolerance.

Quality: Mostly smooth to fairly smooth, some rough, fairly uniform color, fairly clean, mostly misshapen, some fairly well shaped. Grade defects of U. S. No. 2 within tolerance.

Condition: Firm. No decay.

Grade: U. S. No. 2.

(5) U. S. No. 2 with approximately 70% U. S. No. 1 quality.

Size: Generally 1-1/2 to 4-1/2, mostly 2 to 3-1/2 inches in diameter; 2-1/2 to 12, mostly 5 to 10 inches in length; and 3 to 36 ounces in weight. Off-size for U. S. No. 1 ranges from 10 to 25%, average 15%, including 5% off-size for U. S. No. 2.

Quality: Fairly well to well shaped, mostly smooth, some fairly smooth, clean, fairly bright, and fairly uniform color. Grade defects of U. S. No. 1 range from 5 to 25%, average 15%, including less than 10% defects of U. S. No. 2. Defects consist mostly of cuts, bruises and scurf.

Condition: Generally firm. Average 2% decay.

Grade: U. S. No. 2; averages approximately 70% U. S. No. 1 quality.

Remarks: Inspection and certificate restricted to product in 3 upper layers of load. Percentage of U. S. No. 1 quality reported at request of applicant.

(6) Condition Only.

Condition: Generally firm. Most sweetpotatoes show sprouts 1/8 to 3/4 inch in length. From 1 to 15%, average 8% soft rot, Rhizopus Rot, generally in advanced stages. From 2 to 9%, average 6% damaged by slightly sunken, discolored areas, including 3% seriously damaged.

Remarks: Inspection and certificate restricted at applicant's request to Condition only. Applicant states unloaded from PFE 44315.

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UNITED STATES DEPARTMENT OF AGRICULTURE
PRODUCTION AND MARKETING ADMINISTRATION

U.S. STANDARDS FOR SWEETPOTATOES FOR DICING OR PULPING

U.S. No. 1 consists of sweetpotatoes of similar type:

- Which are firm.
- Not badly misshapen.
- Free from soft rot, black rot, cull material.
- Free from freezing injury, scald, cork or other internal discolourization.
- Free from damage caused by dry rot other than black rot, other diseases, bruises, cuts, growth cracks, pithiness, wireworm, weavil, other insects, stringiness, sunburn, mechanical or other means.

Size. The minimum or the minimum and maximum sizes for the foregoing grades may be specified by agreement between buyer and seller. Size shall be stated in terms of diameter.

Appendix E

U.S. DEPARTMENT OF AGRICULTURE
EXTRACT FROM
"MARKET INSPECTION HANDBOOK FOR GARLIC"

GENERAL EXAMPLES

(Market Inspection)

Example 1.

Size: Generally 1-1/2 to 2-3/4, mostly 1-3/4 to 2-1/4 inches in diameter. Undersize within tolerance.

Quality: Mature, clean and bright, generally compact, cloves well filled and fairly plump to plump. Grade defects within tolerance.

Condition: Well cured and dry. 2% shattered cloves. No decay.

Grade: U. S. No. 1.

Example 2.

Size: Generally 2 to 2-1/2 inches in diameter; 3% under 2 inches.

Quality: Mature, clean, fairly bright to slightly stained, generally compact. Cloves well filled and plump. Grade defects average 6%.

Condition: In most samples garlic is well cured and dry, in some samples bulbs and cloves are generally damp with most bulbs materially stained with grey or yellowish discoloration including some bulbs that also show dark surface mold growth. From 1 to 6% average 3% decay. Decay is firm, yellow to brown in color and affects 1 to 2 cloves per bulb. 2 to 15%, average 8% shattered cloves. 3% of bulbs show sprouts 1/8 to 1/4 inch long on 3 to 6 cloves per bulb.

Grade: Now fails to grade U. S. No. 1, 2 inches minimum only account condition factors named above.

Example 3.

Size: Generally 1-1/2 to 2-1/2, mostly 2 to 2-1/2 inches in diameter. Practically no undersize.

Quality: Mature, fairly clean to clean, generally compact, cloves well filled and plump; most bulbs fairly bright to slightly stained, 10 to 25%, average 15% materially stained including 8% badly stained. Most tops 2 inches or less in length, many 2-1/2 to 6 inches long. Other grade defects average 6%.

Condition: Well cured and dry. 1% decay.

Grade: Fails to grade U. S. No. 1 due to excessive staining and excessive tops.

Example 4.

Size: Generally 1-3/8 to 2 inches in diameter; 8% under 1-1/2 inches including 3% under 1-3/8 inches in diameter. 8 to 12 cloves per bulb.

Quality: Mature, clean, bright, generally compact, cloves well filled and fairly plump to plump. From 5 to 20% average 15% grade defects, mostly mechanical injury and second growth.

Condition: Well cured and mostly dry; in some sacks garlic in center of sacks is slightly damp. From 5 to 15%, average 10% damage by Waxy Breakdown. 2% decay.

Grade: Fails to grade U. S. No. 1 due to grade defects and undersize in excess of tolerances but now averages 70% U. S. No. 1 quality, 1-3/8 inches minimum.

Remarks: Count of cloves per bulb reported at request of applicant.

Appendix F

THE UNITED STATES DEPARTMENT OF AGRICULTURE "COMMERCIAL ITEM DESCRIPTION FOR HERBS AND SPICES"

[illegible] Requirements

Spice	Moisture (%) Maximum	Volatile Oil Maximum(%)	Total Ash Maximum(%)	Acid Insoluble Ash Maximum(%)	Particle Size Minimum(%)	Sieve No.	Color ASTA Units	Scoville Pungency Units
Allspice	10	3	6	0.5	95	(#50)		
Bay Leaves	9	1	4.5	1	95	(#30)		
Caraway Seed	10	2	8	1	95	(#30)		
Cardamon Seed	12	3	7	3	95	(#40)		
Celery Seed	10	2	14	2	95	(#55)		
Cinnamon	14	1.5	5	2	95 (Ground Only)	(#60)		
Cloves	9	15	6	0.5	95	(#30)		
Coriander	9	0.3	7	1	95	(#30)		
Cumin	9	2.2	9.5	2	95	(#30)		
Dillweed	10	.2	16	3				
Fennel Seed	8	1	11	1	95	(#25)		
Fenugreek	9.5	Trace	5	1	95	(#25)		

Acid Insoluble Requirements (Cont'd)

Spice	Moisture (%) Maximum	Volatile Oil Maximum(%)	Total Ash Maximum(%)	Acid Insoluble Ash Maximum(%)	Particle Size Minimum(%)	Sieve No.	Color ASTA Units	Scoville Pungency Unit
Ginger	1	1.5	7	1	95	(#35)		
Mace	7	12	3.5	0.5	95	(#20)		
Marjoram	10	0.6	15	4	95	(#35)		
Mustard	10	Trace	5	1	95	(#60)		
Nutmeg	8	6.5	3	0.5	95	(#20)		
Oregano	11	2	9.5		95	(#35)		
Paprika	12	Trace	10.5	3	95	(#30)	Minimum 110	
Pepper, Black	12	1.5	7	1.5	95 5	(#16) (#40)		
					Maximum	(Ground Only)		
Pepper, White	15	1	3	0.3	95	(#40)		
Pepper, Red	11		8	1.5	95	(#40)-GROUND		
					95	(#8)-CRUSHED		
					5	(#20)-CRUSHED		25,000 to 40,000
					Maximum			

Analytical Requirements (cont'd)

Spice	Moisture (%) Maximum	Volatile Oil Maximum(%)	Total Ash Maximum(%)	Acid Insoluble Ash Maximum(%)	Particle Size Minimum(%)	Sieve No.	Color ASTA Units	Sco Pun Un
Poppy Seed	11		10	1				
Rosemary	9	1	9	1	95	(#35)		
Sage	10	1.5	10	1	95	(#20)		
Savory	12	0.5	11	4	95	(#40)		
Sesame Seed	5		5	1				
Sweet Basil	10	0.3	16	2	95	(#35)		
Tarragon	10	0.3	15	1.5	95	(#40)		
Thyme	9	0.8	14	5	95	(#30)		
Tumeric	10	3.5	8	0.6	95	(#45)	5% curcumin	
Blends								
Chili Powder Blend	13		12		95	(#20)		900 t 2,000
Curry Powder Blend	9		7.2		95	(#30)		
Poultry Seasoning	10		10		95	(#30)		

DRAFT

NOTE: This draft, dated 15 July 1987, prepared by the U.S. Army Natick Research, Development, and Engineering Center (GL), Natick, MA 01760-5014 has not been approved and is subject to modification. DO NOT USE FOR ACQUISITION PURPOSES. (Project No. 8950-0315)

A-A-20001

(PROPOSED)

COMMERCIAL ITEM DESCRIPTION

SPICES, GROUND AND WHOLE, AND SPICE BLENDS

The U.S. Department of Agriculture has authorized the use of this Commercial Item Description in preference to Federal Specification EE-S-631.

This Commercial Item Description (CID) covers spices, ground and whole, and spice blends.

Salient characteristics.

The solicitation, contract, or purchase order shall specify the kind of product desired. If the purchaser includes other ingredients than in the descriptions below, the ingredients must be specified in the solicitation, contract, or purchase order.

Spices.

Allspice, Ground. Ground allspice shall be derived from dried, nearly ripe fruit of Pimenta officinalis Lindl and shall possess a fragrant, clove-like aroma, strongly aromatic, pungent, clove-like flavor and a dark reddish-brown color.

Bay Leaves, Whole. Whole bay leaves shall be derived from dried leaves of Laurus nobilis L. and shall possess a delicate, aromatic odor, aromatic, bitter flavor and a yellow-green to brown-green color.

Caraway Seed, Whole. Whole caraway seed shall be derived from dried fruit of Carum carvi L. and shall possess a strong aromatic odor with a bitter flavor, and a light to dark brown color.

Cardamon Seed, Ground. Ground cardamon seed shall be decorticated and derived from dried, nearly ripe fruit of Elletaria cardamomum Maton and shall possess a pleasant, aromatic odor, a characteristic warm, slightly pungent flavor, and a light reddish-brown color.

Celery Seed, Whole. Whole celery seed shall be derived from the dried fruit of Apium graveolens L. and shall possess a characteristic celery odor and flavor with a warm slightly bitter aftertaste and a light brown color.

FSC 8950

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

A-A-20001

Cinnamon, Cassia.

Type I, whole; Type II, ground.

A. Batavia cassia shall be derived from bark of cultivated varieties of Cinnamomum burmannii Blume.

B. Saigon cassia shall be derived from bark of cultivated varieties of Cinnamomum loureirii Nees.

C. Korintji cassia shall be derived from bark of cultivated varieties of Cinnamomum burmannii Blume.

Type III, cut. Stick cinnamon shall be derived from Batavia cassia and shall be cut to a specified length and not to exceed 15 mm diameter.

Type IV, fortified, ground. Fortified and ground cinnamon shall possess a natural cassia or cinnamon base. Fortified cinnamon shall possess an addition of encapsulated essential oil of cinnamon or cassia, or combination thereof.

Cloves, Whole. Whole cloves shall be derived from Caryophyllus aromaticum L. plant and shall possess a strong a aromatic odor with a hot, pungent flavor and a dark reddish-brown color.

Coriander, Ground. Ground coriander shall be derived from dried fruit of Coriandrum sativum L. and shall possess a strong, distinctive, aromatic odor and flavor and a yellow-brown color.

Cumin, Ground. Ground cumin shall be derived from dried seeds of Cuminum Cyminum L. and shall possess a strong, distinctive, aromatic odor and flavor and a yellow-brown color.

Dillweed, Whole. Whole dillweed shall be derived from dried leaves of Anethum graveolens L. and shall possess a pleasant, aromatic odor with anise-like flavor and a bright green color.

Fennel Seed, Whole. Whole fennel seed shall be derived from dried ripe fruit of Foeniculum vulgare Mill and shall possess a pleasant, aromatic odor with a sweet anise-like flavor and a green or yellow-tan color.

Fenugreek, Whole. Whole fenugreek shall be derived from dried ripe fruit of Trigonella foenum-graceum L. and shall possess a strong, pleasant, charred sugar-like odor with a farinaceous, slightly bitter flavor and a brownish-yellow color.

Ginger, Ground. Ground ginger shall be derived from dried root or rhizome of Zingiber officinale Rosco and shall possess an aromatic odor with an aromatic, pungent flavor and a tan to pale brown color.

Mace, Ground. Ground mace shall be derived from dried Arillus of Myristica fragrans Houtt and shall possess a fragrant, nutmeg-like aromatic odor with an aromatic, bitter flavor and a yellow-tan to reddish-tan color.

Marjoram, Sweet, Whole. Whole sweet marjoram shall be derived from the Majorana hortensis Moench plant and shall possess an aromatic, pleasant odor and a light green to light grey-green color.

Mustard Flour. Mustard flour shall be derived from the endosperm of the seed of a blend of Brassica hirta, or Brassica juncea, or Brassica alba and shall possess a characteristic odor and flavor and a yellow color.

Nutmeg, Ground. Ground nutmeg shall be derived from dried kernel of Myristica fragrans Houtt and shall possess a strong, aromatic odor with a warm, slightly bitter flavor and a yellow-brown color.

Oregano, Ground. Ground oregano shall be derived from dried leaves of Origanum vulgare L. plant and shall possess a strong camphoraceous aroma with a pungent, slightly bitter flavor and a olive to green-brown color.

Paprika, Ground. Ground paprika shall be derived from dried red ripe fruit of Capsicum annum L. and shall possess a sweet, nonpungent or pungent flavor and a bright orange to red color.

Pepper, Black, Whole or Ground. Ground or whole black pepper shall be derived from dried immature berries of Piper nigrum L. and shall possess a characteristic, penetrating odor, a hot, biting, pungent flavor and a light grey to speckled black-grey color.

Pepper, White, Ground. Ground white pepper shall be derived from dried mature berries of Piper nigrum L. from which the outer covering or the outer and inner covering have been removed, and shall possess a characteristic, penetrating odor, a hot, biting, pungent flavor and a cream-white color.

Pepper, Red, Crushed or Ground. Ground red pepper shall be derived from red, ripe fruit of Capsicum frutescens L. and shall possess a pungent aroma and a yellowish-red to red color.

Crushed red pepper shall be derived from dried, cut, red, ripe fruit of genus Capsicum and shall possess a slightly pungent aroma and red flakes and yellow seed color.

Poppy Seed, Whole. Whole poppy seed shall be derived from Papaver somniferum L. plant and shall possess an agreeable, nutty flavor and a blue color.

Rosemary, Whole. Whole rosemary shall be derived from dried leaves of Rosmarinum officinalis L. and shall possess a camphoraceous odor with a bitter flavor and a brown-green color.

Sage, Ground. Ground sage shall be derived from dried leaves of Salvia officinalis L. and shall possess a strong, fragrant, aromatic odor with a slightly bitter flavor and a green to greyish-green color.

Savory, Ground. Ground savory shall be derived from dried leaves of Satureja hortensis L. and shall possess an aromatic odor and flavor and a brown-green color.

Sesame Seed, Whole. Whole sesame seed shall be dehulled and derived from dried fruit of Sesamum indicum L. and shall possess a nut-like odor and flavor and a cream-white color.

Sweet Basil, Ground. Ground sweet basil shall be derived from dried leaves of Ocimum basilicum L. and shall possess an aromatic, sweet, anise-like odor with an aromatic, warm, pungent flavor and a green to brown-green color.

Tarragon, Ground. Ground tarragon shall be derived from dried leaves of Artemesia dracunulus L. and shall possess an aromatic odor with a bitter sweet herb flavor and a fairly bright green color.

Thyme, Ground. Ground thyme shall be derived from dried leaves and flowering tops of Thymus vulgaris L. and shall possess a fragrant, aromatic odor with an aromatic, minty flavor and a brown-green color.

Tumeric, Ground. Ground tumeric shall be derived from dried rhizomes of Curcuma tonga L. and shall possess an aromatic, peppery odor with an aromatic, bitter flavor and a yellow to orange-yellow color.

Spice blends.

Chili Powder Blend: Chili powder blend shall have a reddish brown color and be free from lumps.

Formulation:	Ground Chili Pepper	77 to 82%
	Salt	Maximum 8%
	Cumin	Minimum 8%
	Oregano	Minimum 4%
	Garlic Powder	Minimum 1%

Curry Powder Blend: Curry powder shall have a uniform color and shall not stratify in layers nor lump. It shall have a fragrant, aromatic aroma and a warm, bitter taste.

Formulation:	Tumeric	37 to 39%
	Coriander	31 to 33%
	Fenugreek	9 to 11%
	Cinnamon	Minimum 7%
	Cumin	Minimum 5%
	Black Pepper	Minimum 3%
	Ginger	Minimum 3%
	Cardamon	Minimum 2%

Poultry Seasoning: Poultry seasoning shall have a uniform color and shall not stratify in layers nor lump. It shall have a fragrant, aromatic aroma and a warm pungent taste.

Formulation:		
	Sage	72 to 78%
	Thyme	18 to 22%
	Black Pepper	4.5 to 5.5%

Analytical requirements.

Chemical analysis shall be made in accordance with the Official Methods of Analysis of the Association of Official Analytical Chemists (AOAC), or the American Spice Trade Association (ASTA), as applicable.